Vol. 67, No. 7 Established 1884 July 1950

ARCHIVES OF PEDIATRICS

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DISEASES OF INFANTS AND CHILDREN

JOHN FITCH LANDON, M.D., Editor

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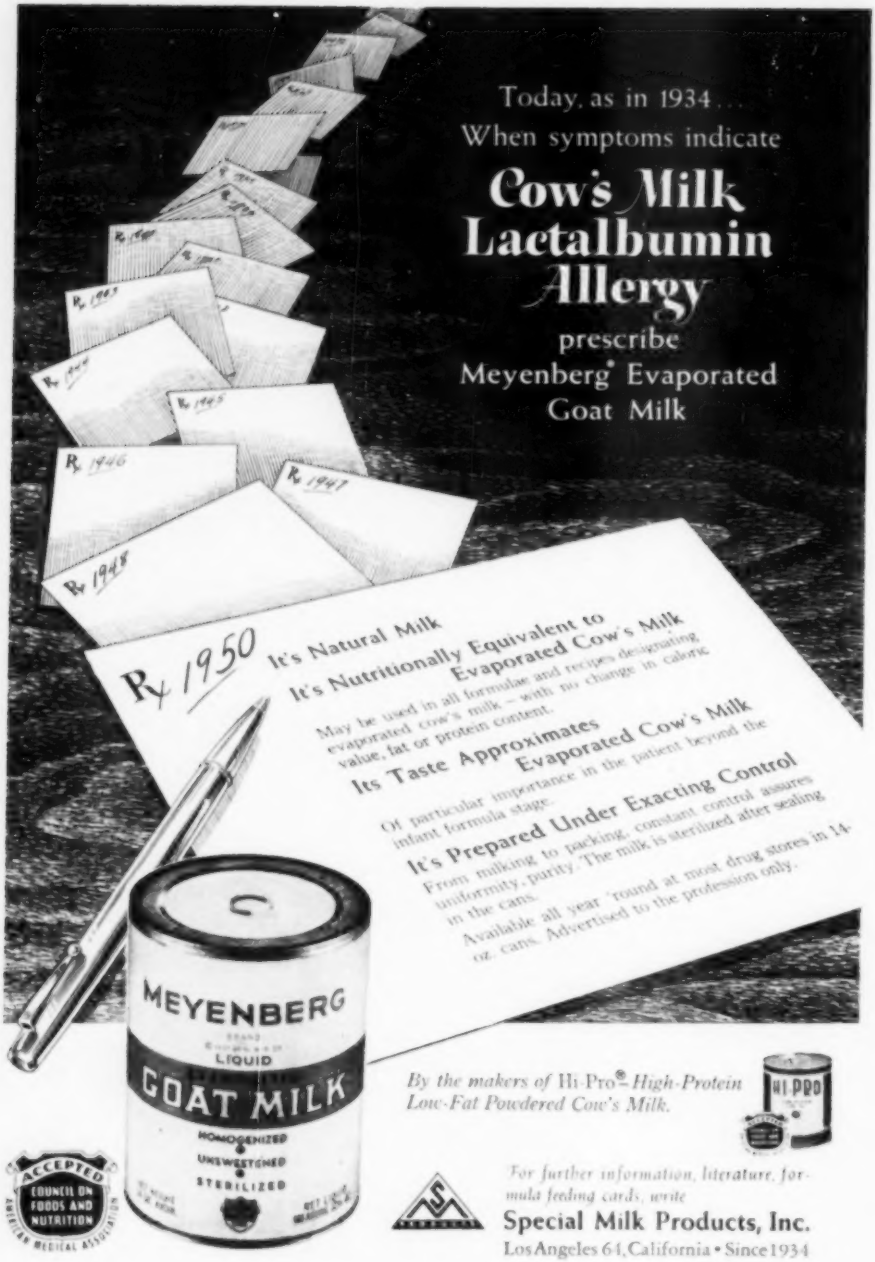
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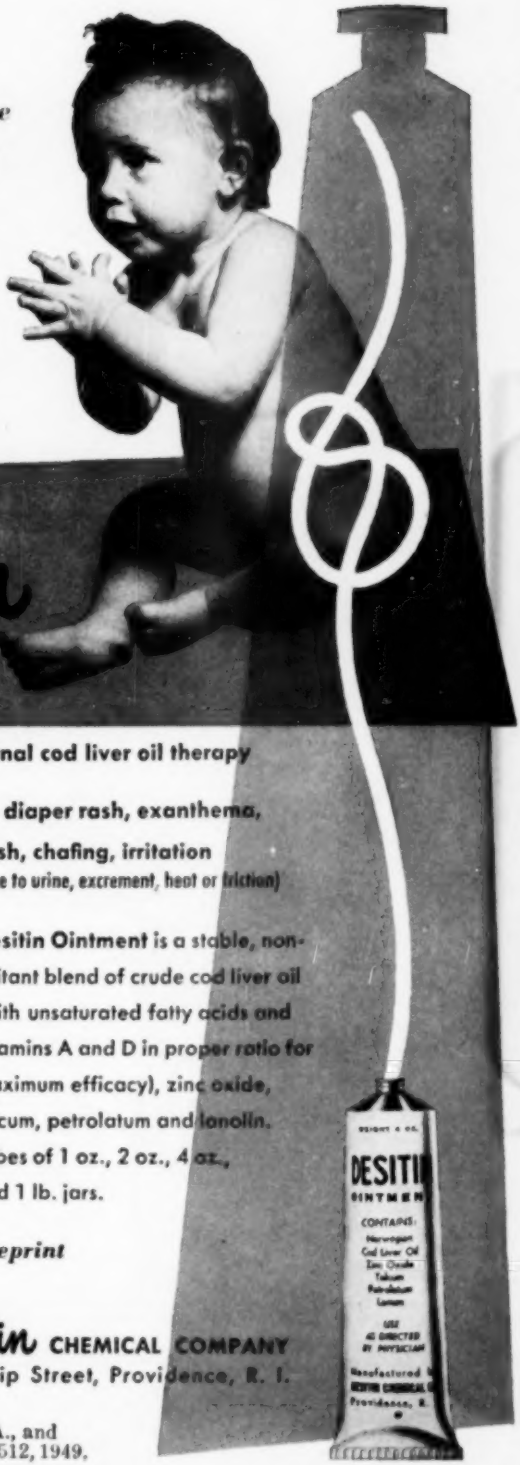

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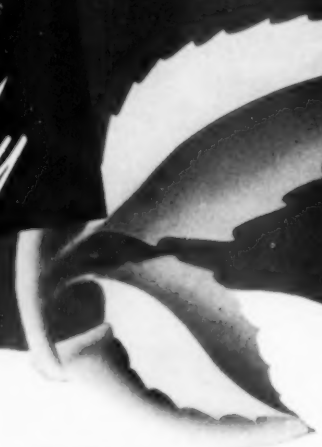

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1. O'Keefe, E. S.: *Am. Jour. Dis. Child.*, 76:616, Dec., 1948.

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DEATHS IN HOSPITALIZED ECZEMA INFANTS*

ABRAHAM B. SCHWARTZ, M.D.

Milwaukee, Wis.

Fatalities in infantile eczema have puzzled pediatrists and dermatologists for a long time. The sudden development of catastrophic symptoms in eczema infants, an experience more familiar to pediatrists than to dermatologists, has led to various interpretations which have been reviewed recently by Freudenberg.[1]

The hazards of the hospitalization of infants, noted by pediatrists,[2,3] was re-emphasized by a dermatologist,[4] who warned against the "light-hearted hospitalization of eczema infants."

An unusually high morbidity and mortality rate among eczema infants admitted to the Milwaukee Children's Hospital was recorded in 1934.[5] In the ten year period from 1925 to 1934, there were twenty-three deaths among one hundred fifty-six infants under 15 months of age admitted with eczema to this hospital. (All deaths among eczema infants occurred in those under 15 months of age).

Since 1935 there has been only one death among three hundred infants admitted with eczema. This death occurred in 1937, and was due to a septicemia following a concomitant otitis and peritonsillar abscess.

The changing experience in the mortality rates of infants during the past fifteen years warrants a re-appraisal of our attitudes to the hospitalization of infants with eczema.

*From the Department of Pediatrics, Marquette University School of Medicine, and the Allergy Clinic, Milwaukee Children's Hospital.

The deaths among eczema infants in the earlier period were due to causes similar to those responsible for deaths among non-eczema infants, namely, upper respiratory infection and its various complications. Even in those instances in which the exitus symptoms were comparable to the "Ekzemtod" of German pediatric literature,[6] the deaths were explainable as hyperergic reactions to overwhelming respiratory infections. (There were four such cases in the reported series[5]).

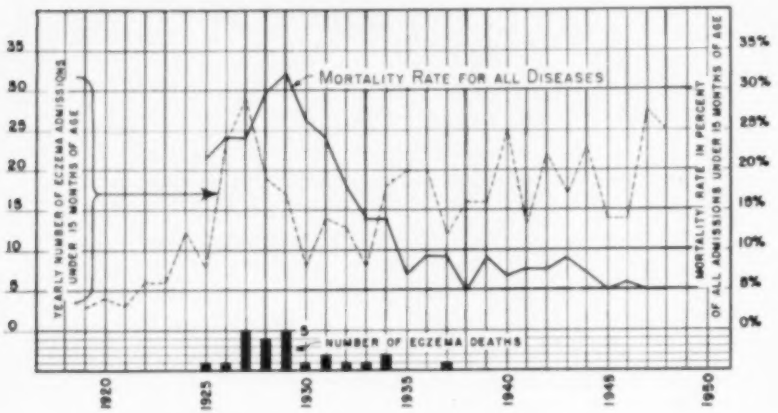

Fig. 1. Relation of Deaths in Eczema to Total Infant Mortality in a Children's Hospital.

A survey of the mortality figures among infants admitted for all causes to the Milwaukee Children's Hospital during the two periods of eczema observations provides an interesting contrast:

	Number of admissions under 15 months of age	Mortality rate
From 1925 to 1934.....	5,627	23%
From 1935 to 1948.....	12,254	6%

The highest number of eczema deaths occurred when the total

mortality of infant admissions was at its peak (Fig. 1). Since the second period of reduced mortality rate corresponds with the introduction of antibiotic therapy it would be assumed that the use of these drugs accounted for the change. A spot check as to the frequency of use of antibiotics in the second group reveals, however, that only about 40 per cent of eczema infants received antibiotic therapy either locally or orally.

This prompts the speculation whether the reduced mortality in both the non-eczema and eczema groups may have been influenced by a reduction in the infectivity of the hospital environment induced by the use of antibiotics in those with active infection.

BIBLIOGRAPHY

1. Freudenberg, E.: Hydrolabität und Todesfälle bei Ekzem. Ann. Paediatr., 162: 162, 1944.
2. McKhann, Charles F.: The Problem of Cross Infections in Infants' and Children's Hospitals. Am. J. Dis. Child., 55: 220, 1938.
3. McKhann, Charles F.; Steeger, Adelbert, and Long, Arthur P.: Hospital Infection. A Survey of the Problem. Am. J. Dis. Child., 58: 579, 1938.
4. Twiston Davies, J. H.: Sudden Death in Infantile Eczema. Brit. J. Dermat. & Syph., 52: 182, 1940.
5. Schwartz, A. B.: The Cause of Sudden Death in Infantile Eczema. J. Pediat., 4: 172, 1934.
6. Finkelstein, H.: Lehrbuch der Säuglings-Krankheiten, Berlin, 1924, p. 816.

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STREPTOMYCIN IN INFLUENZAL MENINGITIS. (Lancet, London, 2: 639, Oct. 8, 1950). Ounsted presents observations on 10 children with meningitis due to Hemophilus influenzae who were admitted to the Radcliffe Infirmary between July 1947 and November 1948. Six of the patients were less than 1 year old, and the eldest was 3 years old. Treatment with intrathecal and intramuscular streptomycin, together with sulfonamides by mouth was successful in 9 cases, and an additional 3 patients have since made complete recoveries. Mental and physical development of the survivors was studied from two and a half to fifteen months after discharge, and no significant retardation was found. The author concludes that streptomycin is an efficient remedy for H. influenzae meningitis. The use of sulfadiazine gives an additional safeguard against drug-fast relapses. Spinal block requires prompt surgical treatment. The combination of streptomycin and sulfadiazine is the treatment of choice. When streptomycin is unobtainable, massive penicillin therapy is useful.—*Journal A.M.A.*

CHICKENPOX SIMULATING KAPOSI'S VARICELLIFORM ERUPTION

Report of Two Cases

Joseph H. Lapin, M.D.
and
Benjamin B. Littman, M.D.
New York.

The difficulty of making an accurate diagnosis of Kaposi's varicelliform eruption was recently demonstrated to us by two cases of chickenpox occurring in children whose skin had been previously damaged, in the first case by erythema multiforme and in the second case by scarlet fever.

An extensive recent review[1] found 96 cases of Kaposi's varicelliform eruption reported in the literature, of which 75 per cent were children, with a mortality rate of 23 per cent. Many workers after Kaposi have assumed the disease to be a generalized vaccinia eruption, some claiming to have identified Guarnieri's bodies in the lesions and to have isolated the vaccinia exposure. However, in the majority of cases, the vaccinia virus can not be isolated nor is there any history of exposure to vaccinia. Recent virus studies have demonstrated that the majority of cases are caused by the herpes virus, judging by animal inoculation, the demonstration of neutralizing antibodies and the presence of nuclear inclusions[1,2]. Clinicians[3] have long recognized that this type of eruption may follow not only atopic dermatitis and eczema, but also on skins damaged by other types of dermatitis. Clinically, there are many graduations in the severity of the skin lesions and toxicity, ranging from a comparatively mild herpes eruption to a fulminating, fatal, toxic eruption covering almost every inch of skin.

The fact that it is sometimes difficult to differentiate severe cases of chickenpox from Kaposi's varicelliform eruption is well-known. Hoyne[4] states: "Kaposi's varicelliform eruptions may resemble chickenpox so closely that it is almost impossible to differentiate clinically the two diseases." If we accept the herpes virus as the cause of the Kaposi eruption, it should be possible to make this differentiation by viral studies, although there seems to be some common antigenicity between the viruses of herpes simplex and of chickenpox. Such could not be done in these two cases, since

neither was hospitalized. Since a well-known dermatologist had made the diagnosis of a Kaposi on one of the cases, we feel that a practical purpose will be served by publication of this report.

CASE REPORT

First Case. M. G. S., a four-year-old boy, had had intimate exposure to chickenpox when he developed a rash due to penicillin therapy and subsequently a severe serum sickness like reaction with a marked erythema multiforme. He was hospitalized for eight days, and, seventeen days after his initial exposure, showed a few vesicles on his body. By the third day, vesicles ranging up to 1 cm. in diameter, sometimes umbilicated, sometimes crusting, appeared in crops all over the body amounting to hundreds in number. The scalp was almost covered, and the mucous membrane of the mouth and anus showed a dozen or more, while the fever ranged from 102° to 106° F. At this point, a dermatologist made the diagnosis of a Kaposi's varicelliform eruption. Within the next four days the child became afebrile, and the vesicles were almost uniformly crusted. After convalescence, a few typical punched-out chickenpox pits were left.

Second Case. B. Z., a three-year-old boy, had a moderately severe episode of scarlet fever, with a follicular exudate on the tonsils, large cervical glands, beefy tongue, and a moderately profuse scarlatiniform erythema on the front and back of the body. With penicillin therapy, he became afebrile on the third day, and the rash faded somewhat. He had had an intimate exposure to chickenpox four days before the onset of the scarlet fever, and on the fourteenth day of exposure to chickenpox began to run fever up to 104° F. together with crops of vesicles, papules and crusts. By the third day, almost 50 per cent of his body was covered with vesicles, the scalp was extensively involved and there were a number of vesicles on the oral mucosa with a temperature up to 105.6° F. He became afebrile on the seventh day, and, later in convalescence, several chickenpox pits were found.

DISCUSSION

While it is well-known that chickenpox, like smallpox, appears more thickly in areas subject to irritation, we can find no reference in the literature to the effect on the clinical course of chicken-

pox of a previously damaged skin. Both of these cases had a far larger percentage of the skin surface attacked by lesions than is common with chickenpox, both had much more oral involvement than is usual, and both were much more toxic, and ran a longer febrile course than is usual with chickenpox. While we were unable to do the viral studies needed for absolute differentiation, nevertheless, we feel that the accurate history of an intimate exposure to chickenpox, the onset well within the usual incubation period of chickenpox, the absence of a previous atopic dermatitis, or of exposure to the vaccinia or herpes virus, and the presence afterwards of several of the diagnostic chickenpox pits make the diagnosis of chickenpox rather than of Kaposi's varicelliform virus most likely. Since there is a marked difference in the prognosis and perhaps also of treatment, we feel it is important in evaluating a case of chickenpox to take into account the previously damaged skin.

SUMMARY

Two cases of chickenpox are reported which simulated a Kaposi's varicelliform eruption. In the first case, the skin had been previously damaged by an erythema multiforme, and in the second case, by scarlet fever.

BIBLIOGRAPHY

1. Ruchman, I.; Welsh, A. L. and Dodd, K.: Arch. Dermat. & Syph., 56: 846, 1947.
2. Sidenberg, S.: Schweiz. Ztschr. f. Path., 4: 398, 1941.
3. Lynch, F. W. and Steves, R. J.: Arch. Dermat. & Syph., 55: 327, 1947.
4. Hoyne, A.: Chickenpox—Brennemann's Practice Pediatrics, Vol. II, Chap. 5, p. 3, 1945.

1166 *Grand Concourse.*

MONGOLISM AND HEREDITY. (Nordisk Medicin, Stockholm, 42: 1923, Dec. 16, 1949). Bredmose says that his genetic research in families with cases of mongolism and families with other forms of mental deficiency, 204 families in all, reveals surprisingly many cases of schizophrenia and manic-depressive psychoses in the former in comparison with the other groups. The frequency of epilepsy was remarkably low in the mongolism families, though greater than normal, the number of cases of abortion seemed to be the same as in the other groups, but there were far more cases of stillbirth and deaf-mutism.—*Journal A.M.A.*

CLINICAL REVIEW

In order to encourage the writing of clinical articles by recent graduates or senior medical students, the ARCHIVES *will publish monthly at least one such paper from the classes of Doctor Reuel A. Benson, New York Medical College, New York, and Doctor Philip Moen Stimson, Cornell Medical School, New York. Other interested medical schools are cordially invited to submit student papers for consideration.*

RECENT TRENDS IN PEDIATRIC ANESTHESIA*

BERNICE R. BLACKMAN, M.D.
New York.

The anesthetic requirements of various age groups have only recently been studied extensively by anesthesiologists. It is the object of this paper to summarize the special problems of pediatric anesthesia and to describe the newer techniques and agents which are being used to overcome these difficulties.

SPECIAL PROBLEMS OF PEDIATRIC ANESTHESIA

In considering the type of anesthesia to be employed, the status of the cardiovascular and respiratory systems, the basal metabolic rate and the psychic tolerance of the patient must be evaluated.

Cardiovascular: The heart rate of infants and children is much more rapid than adults; in addition, it is much more labile, being easily changed to a bradycardia or a tachycardia.[1] Slocum and Allen[2] found that in 23 per cent of 634 children ranging in age from a few hours to 12 years there was marked slowing of the pulse rate during operations on various parts of the body. "In each case the slowing of the pulse was a minimum of 20 beats per minute and occurred within a period of 60 seconds." Decrease in pulse rate was associated with holding of breath during induction, stimulation of active reflex areas particularly in the head and neck, respiratory obstruction either mechanical or reflex, and over-anesthetization. The operative site was found to influence the frequency of bradycardia, operations within the thorax and on the head and neck being related to the greatest percentage of cases. Children with previous cardiac irregularities showed a greater irregularity under anesthesia, while sinus arrhythmias usually reverted to normal. A study by Jackson[3] of 108 children

*Submitted as partial fulfillment of the requirements of the course in Senior Pediatrics at the New York Medical College, Flower and Fifth Avenue Hospitals.

(9 weeks to 12 years old) revealed that extremely rapid pulse rates often occur in the anesthetized child.

The circulation time in children tends to be more rapid than in adults.[4] In maintenance of the circulation during anesthesia, the smaller blood volume and lower blood pressure of infants and children must be kept in mind. Small infants and children sustaining losses of 50 cc. or more of blood during operation should be transfused with at least the same volume of blood since they are very susceptible to circulatory collapse.[5]

Respiration: Respiration in infants and children tends to be irregular and more rapid than in adults. Rapid and deep breathing by infants (seen particularly during ether anesthesia) is likely to lead to collapse because of its exhausting nature.[6] The tidal respiration is small, ranging from 19 cc. in the newborn child to 450-500 cc. in adulthood.[7] The small respiratory exchange makes induction of anesthesia with inhalational agents difficult since it takes longer to obtain a sufficient concentration in the bloodstream.[8] Often the child's irregular respiration makes it difficult to evaluate the rapidity of induction.

Minimization of "dead space" and avoidance of carbon dioxide accumulation has always been a problem in pediatric anesthesia. The dead space is that space containing gases which are rebreathed without coming into contact with the absorbent and are therefore not freed of carbon dioxide.[1] When masks are used for anesthesia the volume of the masks must be considered additional dead space in which carbon dioxide can accumulate.

Metabolism: The basal metabolic rate in infants after the first month or two of life is considerably higher than the adult rate. A peak is reached at about 2 years of age and then gradually diminishes.[7] Induction of anesthesia is slower than in adults, and once anesthesia is established relatively quick lightening may occur because of the rapid catabolization of the agent used.[8]

Young children are quite likely to develop "metabolic" acidosis from vomiting, either preoperatively, due to their illness, or postoperatively, as a result of the drugs, gases or procedures used.

Psychic Factors: The psychological problem must also be dealt with in pediatric anesthesia.[10] Children dislike having a mask held tightly on their faces; they may be terrified by the gowns and masks of the operating room personnel and start to

scream and cry. One of the causes of anesthetic death in a Children's Hospital, Washington, D. C., analysis was overdose of induction agent in a crying, apprehensive child.[11] Anesthesiologists as well as pediatricians are stressing the importance of speaking to children and trying to make them understand what is going to happen if they are old enough, or to play games with them or distract them in some way during induction. It is believed by some anesthesiologists that local and spinal anesthesia are unsuitable for children since they are temperamentally unfit for surgery in a conscious state[8,12] and cannot cooperate as well as adults.

Special Complications: "Ether convulsions" (which may occur during anesthesia with agents other than ether) are seen most frequently in children and youths.[1, 10] These are generalized convulsions, unrelated to the depth of anesthesia and unchanged by lightening or deepening anesthesia. This complication often accompanies toxic conditions, high temperatures and dehydration, but the etiology is still unknown; hypercapnia, anoxia, hypocalcemia, nuerotoxins, overoxygenation, etc., have been incriminated.[1, 13] Convulsions under anesthesia, for which no specific etiology can be determined, are treated best by intravenous sodium pentothal or extract of curare.[13]

PREMEDICATION

The question of premedication for infants and children has been debated for many years. The belladonna alkaloids, atropine and scopolamine, have been objected to, the former for its stimulation and the latter for its depression of respiration. Since these drugs tend to relax the bronchial and bronchiolar muscles, there is a tendency to widening of the respiratory passages following their use, thus increasing the dead space. Hyperthermia may occur in infants and children after administration of the belladonna alkaloids, probably due to the sweat suppressing action of these drugs.[15] Even as late as 1946 some authors believed that atropine should not be used for premedication in young children[16] but the consensus of opinion today is that the advantages of these drugs far outweigh their disadvantages.[1, 16, 17, 18, 19] The dosages employed should be determined by the weight and physical condition of the child rather than by age alone.[1] Dosages as small as grain 1/600 of scopolamine or grain 1/400 of atropine may be used.[17]

The issue of preoperative morphine administration is not as clear-cut. If it is used in very young infants there may be marked respiratory depression, or in those infants with periodic breathing increased periodicity may be seen.[18] Postoperative nausea and vomiting occur more frequently in patients who have received morphine preoperatively.[6, 18] In addition, the small dosages of morphine used in children must be measured by the hospital personnel, and often the mixing is inadequate, leading to inaccurate dosages. Slocum and Allen[2] found in their series that "approximately two-thirds of the cases receiving medication were marked unsatisfactory as having received the drugs too soon or too late before operation, or in doses too light or too heavy."

On the other hand, morphine or demerol administration has many advantages in the anesthetization of the child. It lessens the rapid and exhausting respiratory rate which may at times exceed 100 per minute.[1] By reducing the metabolic rate and diminishing pain it reduces the amount of anesthetic agent required to induce and maintain anesthesia.[18] The child may become somnolent or dull so that apprehensiveness is abolished. Dosages ranging from grain 1/480 of morphine or 13 milligrams of demerol up to the adult dose depending on the weight of the child have been suggested.[4, 18]

Some writers suggest substituting codeine[1] or barbiturate[17] for morphine, but in general these drugs are not as effective. It must also be remembered that small doses of barbiturates have a soporific and not an analgesic effect; in the presence of pain they may not only fail to induce sleep but may actually produce delirium.[15]

The use of barbiturates as premedication in addition to morphine has been advocated.[18, 20] They may be given the night before operation or in conjunction with morphine and atropine. The latter combination is supposed to be particularly effective when cyclopropane anesthesia is to be used since it is believed that respiration is not depressed as much.[18]

BASAL ANESTHESIA

Basal anesthesia has been used in order to eliminate the use of morphine as premedication, to decrease the amount of inhalational or intravenous agent, and to carry on short, relatively non-

traumatic procedures, such as pneumo-encephalography and cystoscopy.[23] Until a few years ago tribromethanol (avertin) was the drug most frequently used, but recently rectal instillation of drugs of the barbituric acid series in anesthetic doses has been employed. The advantages of barbiturates over tribromethanol are the smaller volume of solution required, the ease in preparation of the solution as compared to the heating, shaking and testing of acidity of the tribromethanol solution, and the elimination of rectal irritation.[24] Children are believed to be more resistant to the action of pentobarbital sodium than adults and consequently larger doses of this drug in proportion to the body weight are given.[19] Some reports state that pentothal sodium should not be used for basal anesthesia in children because it is a strong respiratory depressant.[16] In 300 cases, however, this effect was not prominent in the dosages given (0.2 cc. of 10 per cent solution per pound).[24] Seconal has also been used in dosages of 0.14-0.15 grains (9-9.5 milligrams) per pound.[26] The barbiturates have been given to children 3 weeks to 12 years old in conjunction with supplementary anesthesia, and good results were obtained in the great majority of cases.[24, 27]

The main disadvantages found in the use of barbiturates were a considerable increase in the awakening time and in postoperative restlessness[21, 22] This was found particularly in children who weighed over 75 pounds, since a large dose of drug was required for basal anesthesia. Other effects of anesthetic doses of barbiturates may be lowering of blood pressure, depression of the rate and depth of breathing, reduction of the basal metabolic rate, and depression of the vasomotor center so that peripheral vasodilatation occurs.[14] The last mentioned effect has been cited as an advantage of barbiturate basal anesthesia in transfusing young children since the superficial veins will dilate and be more accessible to venipuncture while the children sleep lightly.[19]

In general, premedication is taking the place of basal anesthesia for major surgical procedures on children. Because the drug cannot be controlled once it is instilled, because its effects are variable, and because the effects are long lasting and require more nursing care, basal anesthesia is gradually falling into disuse.[5] On the other hand, the advantage of having the child fall asleep quietly allows an easier induction and prevents psychic trauma in nervous or apprehensive individuals.[14, 21]

ANESTHESIA WITH VOLATILE AND GASEOUS AGENTS

Most anesthesiologists are agreed that in the hands of the casual anesthetist ether administered by the open drop technique is the safest form of anesthesia for the child. In experienced hands, however, techniques, such as endotracheal intubation and agents, such as cyclopropane, have been found to have certain advantages for both the surgeon and the anesthetist. The recent tendency has been to use agents other than ether whenever possible. Ether, besides being irritating, may also increase the concentration of the blood, elevate the blood sugar and the pulse rate, and cause a metabolic acidosis.[3, 4] Induction by agents, such as vinethene, is preferred because of their relatively pleasant odor and quick action.

Endotracheal intubation for children received a great impetus from the invention of the Ayre T tube. This apparatus consists of a simple T tube, one arm of the cross bar being connected to the endotracheal tube, the other arm open to the outside, and the vertical limb attached to the anesthesia apparatus. The purpose of the tube is to eliminate dead space and prevent the accumulation of carbon dioxide. Endotracheal intubation has been found most valuable for operations on the head and neck and intrathoracic surgery. A study of 1,550 tonsillectomy cases (ages 3 to 68 years with a mean age of 9 years) revealed that asphyxia, aspiration and postanesthetic depression were avoided by the use of intubation and nitrous oxide anesthesia. The main complication was epistaxis which was easily controlled. The author states that this technique was used only when the surgeon usually required more than 10 minutes for the procedure.[25] For operations on cleft palate and hare lip, procedures which require at least half an hour for thorough repair, endotracheal anesthesia has been widely acclaimed mainly because it permits the anesthetist to be out of the operative field while allowing adequate anesthesia to be administered.[6, 26] During surgery of congenital heart defects endotracheal intubation and cyclopropane administration have been employed extensively. Cyclopropane is valuable because it permits the use of high partial pressures of oxygen. In some cases curare is also used to allow very light planes of anesthesia.[27] In a series of 700 operations it was found that cyclopropane plus

small amounts of ether supplied by tube into the trachea was the procedure of choice. If there was a very small flow of blood through the pulmonary circuit a longer period of induction using a higher percentage of anesthetics was required. Lower plane i or upper plane ii were found to be the best levels. Transient cardiac arrhythmias occurred but were controllable either by modifying the anesthetic and oxygen tensions or by lightening or deepening anesthesia.[28] It was found that the quietest respiration consistent with adequate oxygen supply should be maintained. In some institutions once the thorax was opened the anesthetist reinflated the lungs for a few seconds every ten minutes in order to allow easy re-expansion at the end of the operation and to prevent postoperative pulmonary complications.[29] In others, respiration was completely controlled and maintained by the anesthetist after intubation with complete absence of voluntary respiration, thus allowing adequate ventilation when open pneumothorax was present.[27]

The difficulties of endotracheal intubation in children are due chiefly to the anatomy of the respiratory passages. The larynx is more anterior and very small, the epiglottis is relatively large, convex and very close to the glottis, and the trachea is short allowing intubation of the right bronchus with compression and collapse of the left bronchus.[6] Complications which may occur during operation include laryngeal edema and epistaxis, while postoperatively nausea and vomiting, cough, tracheitis, excessive mucous secretion, bronchopneumonia, recurrence of upper respiratory infections, convulsions, shock and hemorrhage may occur.[6] Serious complications are uncommon, however, and anesthetic deaths are rare.

INTRAVENOUS ANESTHESIA

Intravenous anesthesia has not been used extensively for children, partly because of the variability of their reactions to drugs and partly because of the relative inaccessibility of their veins. Pentothal by vein has been used in the reduction of fractures[30]; it has also found some popularity as a basal anesthetic supplemented by nitrous oxide. For greater safety the drug may be given by the following method: "After venipuncture a test dose of 1 or 2 cc. of 2½ per cent solution of 'pentothal' is administered

to determine the patient's tolerance to the drug. When this has been done 'pentothal' is injected slowly and cautiously into the child."[31] Many writers believe that the margin of safety with intravenous barbiturates is too small to warrant their use in young children.[1, 32]

Myanesin was used in a series of 40 cases as a supplement to intravenous pentothal anesthesia in children 3 to 12 years old. It was found that lightly anesthetized patients had sufficient abdominal relaxation without diminution of intercostal or diaphragmatic activity. Relaxation occurred one minute after injection of myanesin and lasted for 7 to 15 minutes while another injection of half the initial dose allowed relaxation to last up to 30 minutes. Myanesin did not increase the depth of anesthesia but did lengthen the duration. Because of the hemolytic effect of the drug experimentally, spectroscopic examination of the urine was made postoperatively but no evidence of the presence of hemoglobin was found.[33]

Curare has been administered intravenously as well as intramuscularly to infants and young children. A report of its use as sole agent in 41 cases ranging in age from 20 hours to 2½ years describes sufficient relaxation for major surgery (including intra-abdominal and intrathoracic surgery) without the use of supplementary anesthesia. Premedication was used in 13 cases. The author believes that since curare has no central depressing effect psychic trauma may occur and therefore recommends additional anesthesia.[34]

SPINAL ANESTHESIA

Spinal anesthesia has not been used much for children mainly because it is believed that they are unable to cooperate as well as adults. The lability of their circulatory systems has also been cited as an argument against this technique.[1] Under certain circumstances, however, some writers consider it the procedure of choice particularly when respiratory tract diseases or metabolic acidosis, due to starvation and vomiting, are present.[4, 35] Premedication is given to cause drowsiness and 1 milligram of procaine or 0.1 milligram of pontocaine per pound is the approximate dose.[35] Satisfactory anesthesia by this method has been obtained in infants as young as 11 days.[36] In a series of 438 cases of chil-

dren ranging from 2½ months to 16 years (70 over the age of 12) Vara Lopez[37] found spinal anesthesia completely satisfactory for operations on the lower abdomen and extremities. The dosage (of percaine) depended on the age, weight and length of the spinal column of the child. After injection of the drug into the spinal canal, pallor occurred in 0.9 per cent, nausea in 3.9 per cent and vomiting in 1 per cent with complete relief after vomiting. A mild hypotension was observed in 73 per cent and an increased blood pressure in 4 per cent. The pulse in most cases was accelerated while the frequency and depth of the respiratory movements were unchanged. No other complications were observed either during or after operation. There was a tendency for the children to sleep after spinal anesthesia but they could be aroused by very slight stimuli. Continual warmth during the operation and postoperatively may be valuable.[38]

CONCLUSION

Attention to the special problems of pediatric anatomy and physiology has permitted the application of newer anesthetic techniques to pediatric patients, resulting in facilitation of surgical procedures and greater comfort and safety for the patient. Since this is a relatively new field of observation further advances may be expected in the near future.

REFERENCES

1. Adriani, V.: Techniques and Procedures of Anesthesia. 1947.
2. Slocum, H. C. and Allen, C. R.: Bradycardia in Children under Ether Anesthesia. South. M. J., 37: 159-162, March 1944.
3. Jackson, K.: Tachycardia in Children During Anesthesia. Anesthesiology, 9: 573-584, 1948.
4. Leigh, M. D. and Belton, M. K.: Symposium on Pediatric Surgery. Pediatrics, 1: 790-794, June 1948.
5. Leigh, M. D. and Belton, M. K.: Pediatric Anesthesia, 1948.
6. Leigh, M. D. and Kester, H. A.: Endotracheal Anesthesia for Operations on Cleft Lip and Cleft Palate. Anesthesiology, 9: 32-41, Jan. 1948.
7. Nelson, W. E.: Mitchell-Nelson Textbook of Pediatrics, 4th ed., 1945.
8. Kaye, G.; Orton, R. H. and Renton, D. G.: Anesthetic Methods, Melbourne, 1946.
10. Mallinson, F. B.: Anesthesia Problems in Children. M. Press, 208: 416-419, Dec. 1942.
11. Cronin, D. L.: An Analysis of Anesthesia Deaths in Children's Hospital from 1941-45. Clin. Proc. Child. Hosp., 2: 225-232. Sept.-Oct. 1946.
12. Adams, R. C. and Lundy, J. S.: Factors Influencing the Choice of the Anesthetic Agent and Some Suggestions on Anesthetic Technique. S. Clin. N.A., 20. 1940.
13. Belinkoff, S.: Convulsions under Anesthesia in Children. Anesth. & Analg., 28: 40-44. Jan.-Feb. 1949.
14. Goodman, L. and Gilman, A.: The Pharmacological Basis of Therapeutics, 1941.
15. Macon, E. B.: Clinical Anesthesia in Children. Anesth. & Analg., 25: 162-167, July-Aug. 1946.
16. Nagle, P. J.: Anesthesia in Childhood. Irish J. M. Sc., pp. 690-696, Oct. 1946.
17. Leigh, M. D. and Belton, M. K.: Premedication in Infants and Children. Anesthesiology, 7: 611-615, Nov. 1946.
18. Adams, R. C.: Intravenous Anesthesia, 1944.

19. Spaid: Anesthesia for Oral Surgery During Infancy. J. Indiana M.A., 34: 143-145, March 1941.
20. Poe, M. F., and Karp, M.: Seconal as a Basal Anesthetic Agent in Children. Anesth. & Analg., 25: 152-157, July-Aug. 1946.
21. Burnap, Gain and Watts: Basal Anesthesia in Children Using Sodium Pentothal by Rectum. Anesthesiology, 9: 524-531, Sept. 1948.
22. Karp, M. and Teuscher, G. W.: General Anesthesia in the Difficult Pendodontic Patient. J. Pediat., 30: 317-323, March 1947.
23. Schotz, S.: Rectal Pentothal for Basal Narcosis in Infants. Anesth. & Analg., 21: 295-299, Sept.-Oct. 1942.
24. MacIntosh, R. R. and Bannister, F. B.: Essentials of General Anesthesia, 1943.
25. McCarthy, K. C.: Endotracheal Nitrous Oxide Anesthesia for Tonsillectomy. Report of 1,550 Cases. Anesthesiology, 1: 215-222, Sept. 1940.
26. Segal, B.: Open Endotracheal Method of Anesthesia for Harelip and Cleft Palate Operations on Infants. South African M.J., 21: 484-485, July 1947.
27. Ortum, R. H.: Anesthesia in Surgical Treatment of Tetrology of Fallot, M. J. Australia, 1: 733-735, 1948.
28. Berger, O. L.: Further Observations on Anesthesia for the Surgical Treatment of Cyanotic Congenital Heart Disease. J. Am. A. Nurse Anesth., 17: 19-24, 1949.
29. Gillies, J.: Anesthesia in Operations for Patent Ductus Arteriosus. Proc. Roy. Soc. Med., 38: 545-547, Aug. 1945.
30. DeRoma, J. and Bacigalupo, G.: Anestesia General Endovenosa con Dorico Soluble en Traumatologia Infantil. J. Internat. Coll. Surgeons, 10: 350-351, May-June 1947.
31. Fox, S. L. and Shane, S. M.: Pentothal for Tonsillectomy in Children. South. M. J., 40: 848-851, Oct. 1947.
32. Lundy, J. S. and Adams, R. C.: Intravenous Anesthesia. Anesthesiology, 1: 145-152, Sept. 1940.
33. Wilson, H. B. and Gordon, H. E.: Myanesin as an Aid to Anesthesia in Children. Lancet, 1: 367-368, March 1948.
34. Smith, S. M.: Use of Curare in Infants and Children. Anesthesiology, 8: 176-180, March 1947.
35. Woodbridge, P. D.: Indications and Contraindications of Spinal Anesthesia. S. Clin. N. A., 20: 615-630, 1940.
36. Armstrong-Davison, M. H.: Spinal Analgesia in an Infant 11 days old. Brit. M. J., 2: 264-265, Aug. 24, 1946.
37. Vara Lopez, R.: La Raquianestesia en la Infancia. Med. espan., 8: 242-250, Sept. 1942.
38. Etherington-Wilson, W.: Spinal Analgesia in the Very Young and Further Observations. Proc. Roy. Soc. Med., 38: 109-115, Jan. 1945.

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PNEUMONIA TREATMENT IN CHILDREN. (Ugeskrift for Laeger, Copenhagen, 111, 1476, Dec. 29, 1949). Of 554 children with pneumonia, of whom 236 were aged less than 1 year, 211 were treated with a single massive dose of sulfathiazole, 69 with two massive does and 274 with one massive dose and penicillin. The total mortality was 6.1 per cent. Of the 33 deaths 31 were among children under 1 year of age; 15 deaths were due to pneumonia, and 18 to complicating diseases (congenital heart disease, acute malignant tracheobronchitis, grave malformations). Buch finds that the treatment with one massive dose of sulfathiazole, or sulfathiazole and penicillin, gives better results than continuous treatment and that the complications are few and unimportant. The decrease in temperature is usually rapid. The practical advantage of a single dose makes the treatment well suited for children. —*Journal A.M.A.*

CLINICAL REVIEW

In order to encourage the writing of clinical articles by recent graduates or senior medical students, the ARCHIVES *will publish monthly at least one such paper from the classes of Doctor Reuel A. Benson, New York Medical College, New York, and Doctor Philip Moen Stimson, Cornell Medical School, New York. Other interested medical schools are cordially invited to submit student papers for consideration.*

PREVENTIVE PSYCHIATRY IN PEDIATRICS*

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A recent report by Kraines[1] points out the need for preventive psychiatry. He reminds us that today over half a million U. S. citizens are confined to mental institutions; and it is estimated that over ten million (one-fourteenth of the total population) persons now living will sometime in their lives need hospitalization in a mental institution. More than one and three-quarter million men were, because of psychiatric and allied disorders, rejected by the army, and more than fifty per cent of the medical discharges were for psychiatric reasons. From one-half to three-quarters of all patients seeking medical aid have some psychoneurotic ailments. More than sixteen thousand people committed suicide last year. The law courts also confirm the need for preventive psychiatry. In 1942 a hundred and fifty-seven thousand were in prison. In the same year, five thousand persons were charged with murder, and there were one-quarter million divorces as over against one and three-quarter million marriages.

When, then, asks Kraines, should prevention start, and where? "It is the childhood experiences which to a large degree determine adult personalities and patterns of behavior. The repeated response becomes habitual and tends not only to perpetuate itself, but to irradiate. It is in the framework of the interrelations of parents, of parents and children, of the child and his siblings, that far too often there emerges the picture of insecurity, dependence, intellectual subjectivity, egocentricity and emotional stability.

"Preventive work then begins in the home; but the home itself does not exist and cannot be modified as a self-limited entity. Just as the child echoes the harmony or dissonance, reflects the

*Submitted as partial fulfillment of the requirements of the course in Senior Pediatrics at the New York Medical College, Flower and Fifth Avenue Hospitals.

light or shadow of his home, so the family in turn is bound up with and determined by the larger society of which it is a part."

Veeder[2] believes the task and responsibility of practicing preventive psychiatry in infancy and childhood rests mainly with the pediatrician or the general practitioner. Their main obligation is the *prevention* of behavior problems rather than their treatment. He points out that behavior problems of any significance or importance do not come on abruptly. They usually are of long standing, have deep seated origins, and the presenting complaint is but an episode in the total picture. Many can be traced back to conditions in parental attitudes which have had their beginning in infancy and during the second year of life. It is at this stage of development that the doctor is almost the sole authority to whom the parents look for guidance.

Helmholz,[3] Chief of the Section on Pediatrics of the Mayo Clinic, finds that the field of activity of the general practitioner has been radically changed. He now realizes that the physical diseases of childhood are often less of a problem for him than the regulation of the life habits and mental health of the child. This has obliged him to study the effects of parental attitudes and the origin of these attitudes. He has been inducted into psychiatry by force of circumstances. Menninger[3] finds psychiatrists were forced into a better acquaintance with pediatrics through a similar evolution. With the monumental discoveries of Sigmund Freud the psychiatrists have come face to face with the fact that the mental afflictions of adults are regularly referable to the emotional conflicts, pressure, stresses and traumatic experiences of childhood. Psychiatrists have gradually given more and more attention to disturbances in children which had previously been regarded as trivial, inconsequential, transient and negligible. Like the pediatricians they were forced, then, to be more concerned with the pathological attitudes and behavior of parents, the results of which were manifested first in childhood and later in the adulthood of those traumatized children. Gradually, therefore, a specialty within a specialty has grown up, that of child psychiatry.

Senn[4] gives us a historical picture of the development of the relationship of pediatrics and psychiatry, which I have summarized. In terms of mental health and disease pediatric attention was first turned toward neurologic problems. This interest in

organic pathology, especially of the brain, paralleled a similar interest held by psychologists and stemmed largely from the influences in the period of American history when ideas of superstition were abundant. The human mind was regarded, as it had been for centuries, in the belief that all nervous tissue was patterned after a common mold and that the mind, as nervous tissue, existed independently of the rest of the body. Toward the end of the nineteenth century, which was characterized by a period of general interest in spiritualistic manifestations, disciples of the German Wundt began to use objective techniques for the study of the mind, and especially of sensation, so that as a result of the methods of physics and physiology, psychology was transformed more and more into a natural science. The influence of Darwin in this direction was still greater. By demonstrating similarity between the behavior of infants and that of animals, and by correlating emotions with bodily expressions, Darwin showed that investigation of the human mind was part of the study of nature. In presenting this concept he antedated the present day concept of psychosomatic medicine by over half a century. Consideration of the mind in terms of evolutionary concept was advanced further about the beginning of the nineteen hundreds by such psychologists and educators as G. Stanley Hall, E. L. Thorndike, William James and John Dewey. Their researches extended into the field of animal learning and, later, of child learning, and, as a result, basically altered the concept of child training and education, and marked the actual beginning of child psychiatry in this country.

The next step in the development of pediatrics in this country was in the direction of psychology. Tests for the measurements of intelligence and developmental behavior appeared in the United States, and the standards of Benet were translated by Terman into American values in 1916, and Gesell, the American pediatrician, and his co-workers presented their extensive studies on infant behavior and growth. Adolf Meyer, known as "the father of American psychiatry," made some of his earliest contributions in this field, by writing on mental abnormalities in children, and Rachford published his book on "Neurotic Disorders of Children" in 1905. From the standpoint of the development of child psychiatry as a scientific discipline in this country, a gain probably was made through the knowledge of behavorism, in that mind and body were no longer considered in a dualistic relation.

In the early years following World War I, former President Herbert Hoover, in 1921, as head of the Child Hygiene Association, took steps to increase the effectiveness of work done on behalf of children, and in 1923, the American Child Health Association was formed through the efforts of pediatric groups.

The next great step in the development of child psychiatry in this country came as a response to an appeal from citizen groups in social work, sociology, psychology, education, law and medicine, for the prevention and control of delinquency and mental disease. As a result, an active mental hygiene movement evolved. With the help of the Commonwealth Fund, the National Committee for Mental Hygiene, about 1920, formulated plans for work in child welfare, and, through the development of child guidance clinics, set up a five year plan with the following objectives:

To develop the psychiatric study of difficult, predelinquent and delinquent children in schools and juvenile courts, and to develop sound methods of treatment on such study;

To develop the work of the visiting teacher, whereby the invaluable early contacts which our school system makes possible with every child may be utilized for the understanding and development of a child;

To provide courses of training along sound lines for those qualified and desiring to work in this field;

To extend by various educational efforts the knowledge and use of these methods.

The Child Guidance Clinics are still in existence today and assume an active role in the psychiatric treatment of children, in parental guidance, and in the training of physicians and in psychotherapy.

Dr. Senn points out that up to about 1930 psychiatry was not integrated with the rest of medicine, and pediatrics saw in medical psychology nothing that it might incorporate into itself except intelligence testing. Dr. Adolf Meyer, of the Phipps Psychiatric Clinic, had long been interested in mental hygiene and child guidance and early stressed the desirability of preventing emotional difficulties in children. His theory of psychobiology stressed the importance of the patient as a person whose life history must be studied, as well as his mental and physical capacities, in order to understand his problems. For this reason Meyer advised the use

of social workers, schools and other agencies to provide information about the patient and to help in his life's adjustment. These practical suggestions have not only become basic principles in child psychiatry today, but, through the pioneer work of Kanner as liaison psychiatrist between the Harriet Lane Home for Invalid Children and the Phipps Psychiatric Clinic at Johns Hopkins Hospital, have influenced pediatric practice and education to think of mental health as part of physical health.

In 1936 Veeder and Aldrich came out with papers outlining the scope of graduate education in pediatrics, and included child guidance for mental hygiene and growth and development as requisite in training. Casparis and Davison encouraged the pediatrician to include mental hygiene as part of his practice. Brennemann advocated the integration of psychology into pediatrics. Powers, Brennemann and Aldrich deplored the rigidity and impersonality of infant feeding, pointed out the psychologic implication in the feeding of infants and children, and recommended a more humane and psychologic approach in all child care.

Many pediatricians look for help in obtaining professional guidance and training, and some of them turn to the Commonwealth Fund. In 1937, the Commonwealth Fund established the first fellowship in pediatric psychiatry, which provided training for a period of two years for accredited pediatricians in order that they might, on completion of this experience, take up teaching positions in pediatric centers and help other pediatricians get a working knowledge of medical psychology, which they might, in turn, incorporate into the practice of pediatrics within the hospital setting, and in the care of the ambulatory patient. The creation of fellowships for the training of pediatricians in psychiatry has continued.

The psychoanalytic movement of Freud has been of the profoundest importance in changing psychiatry and pediatrics. Although there have been reckless and uncritical popularizations as well as unsympathetic diatribes directed against the Freudian concept, it is apparent that these new developments were part of a general movement against scientific absolutism and determinism. The psychoanalytic movement has demonstrated the dynamic powers of the unconscious, that symptoms and fantasies as well as inarticulate emotions result from the accumulations of energy and

internal tensions incident to underlying anxiety, and that emotional as well as physical processes in the body are regulated by a sum total of psychochemical forces, which function as they do because of the relationship of one's historical past and one's life experiences. As a result of these teachings, psychiatry has turned its interest from the classification and study of mental disease, especially the psychosis, to the observation of people, both well and sick, in order to learn what the "dynamic mechanism" of behavior comprised. Such a study of individual and psychoanalysis by the method of retrospective research not only supplied new information about psychophysiology, psychopathology and psychotherapy, but yielded important data about infancy, childhood, adolescence and parental relationship. Not content, however, with these achievements, the psychoanalytic group has increasingly requested that pediatrics, through its interest in the infant and with its opportunities for long term observation of the child growing in its natural habitat, the family setting in a home, study contemporaneously and longitudinally the life history of their child patients, thus helping not only to fill the gap in the knowledge of personality development, but testing as well those hypotheses which the psychoanalysts themselves question.

Freud and Meyer, although representing different schools of thought, were in agreement in pointing out that personality is a summation and synthesis of all forms and aspects of the life of the human being, organic, economic, cultural, sociologic and psychologic. Today, adherence of both the psychoanalytic and psychobiologic concepts emphasize the opportunity of the pediatrician to join with psychiatrists, physiologists, anthropologists and sociologists in a program of "prospective" research in child development, which, with a study of "retrospective" psychoanalysis, promises to yield information from which basic principles of child rearing, child education and child care in health and in sickness may be evolved. The contemporary research work of Washburn of the Child Research Council in Denver, and of Aldrich at the Mayo Clinic, bears testimony that modern pediatrics has once again recognized the trend of events, and has found its place in the mosaic setting of history. The long term comprehensive study at these two centers will unquestionably furnish data which will augment and modify the conception of the child and its care.

That it is fundamental for pediatrics to take an active part in this new development was emphasized by the experience of many practitioners in World War II, when, as physicians in induction centers, and in veteran rehabilitation clinics alike, they were impressed by the number of individuals who were in need of psychiatric guidance because something had gone wrong in their personality development, beginning in infancy and early childhood.

A critical review of the methods of child rearing, educational and physical and emotional care, seems indicated as a first step in an attempt to understand these problems. Where a careful examination has been made, there is evidence that there must be reorganization of attitudes of child development, parental guidance and medical care, since in tracing the origin of emotional disturbances, there are repeatedly encountered stories of tension between parent and child, as it passes through the various stages of growth, especially tension around the everyday situations of weaning, feeding, toilet and habit training, sleeping and disciplining. The pediatrician again appears at the cross-roads in considering how to modify his technique so that he may serve better the individual parent and child, and thereby prevent some of the deviations of personality development which are seen so frequently in all medical practice today. And, as a corollary, educators of pediatricians must consider what changes are in order to provide them with new insights and ability to carry on these new functions. Pediatricians who are in training, in practice or just returned from war service, are in agreement in requesting, even demanding, opportunities for training in medical psychology of a short or long-term variety. One of the most acute problems in medicine today exists in providing instruction in this field which will be sound and practical and which may be incorporated in a natural fashion into pediatric care. The most promising prospect for such correlated teaching so far has been the long-term variety in the pediatric department of medical schools and of teaching hospitals which have the facilities to study infants, children and adolescents for fairly long periods, both as sick and as convalescent in-patients and as out-patients, and where there are enough well trained teachers representing both pediatrics and psychiatry who are capable and desirous of relating one discipline to the other.

The Child Guidance Clinics play an active part also in the

training of physicians and psychotherapists. A recent report by Allen[5] states that there is an important uniqueness to the training of a psychiatrist in a Child Guidance Clinic that stems from the nature of the problem the Clinic is called upon to serve. The Clinic provides the structure of a service that allows for the participation of parent and child, since problems in childhood involve this basic parent-child relationship. This uniqueness, characteristic of the professional service built by the collaboration between professional groups, profoundly influences the training. The student finds that the part of the service for which he is responsible is in close relation and dependent upon the case workers close relationship to the parent. Together they build the clinic service. The parents actively participate in therapy through the relationship they establish with the social worker, and round out the clinic service which therapist and case worker build. The student psychiatrists learn to be a part of a service whereas in previous professional experience, their relationship to the patient has had more wholeness. Training in the setting of a clinic, Dr. Allen maintains, involves more than just learning to respect the function of the case worker and the psychologist. The student must utilize their services; he must know that the social worker in her relationship with the patient needs to utilize what he is doing with the child. A truly collaborative relation is required; he is not free to proceed with his work without regard to where the parent and social worker are in the process.

Dr. Allen urges that the clinic, through the competence of a trained staff, should provide a sound therapeutic service adapted to the needs of those who seek its help. Providing the structure of a training program requires an understanding of the difference between knowledge and skill and the relation one has to the other. The student may acquire all available knowledge about children and how problems develop and still lack the skill to use his knowledge for the benefit of the child needing therapy. Among the seminars that should be a part of every training program of the future are: 1. Principles of psychotherapy. 2. A seminar on the interrelated movement of parent and child. 3. A seminar on psychological and educational tests and their place in a clinic program. The three seminars should be on the curriculum of every training center, and be led by the psychiatrists, the social workers

and the psychologists. Other seminars on special aspects of the clinic job can be added as a training program develops.

It is Dr. Allen's conviction that the future of child psychiatry is entirely a matter of trained personnel. The field is now maturing and it is necessary to move away from the haphazard training of the past, and bring the accumulating knowledge of what is important for professional development into a new perspective about training. Unless this is done, clinical work will suffer, and a field rich in opportunity for professional development will sink into a static state of lethargy.

We should not lose sight of the idea, however, that prophylaxis is always better than belated efforts at cure. In investigating the origin of emotional disturbances, Spock[6] frequently encountered stories of friction developing in infancy and early childhood around certain typical everyday situations. The commonest were feeding, weaning, thumb-sucking, toilet training, anxiety incidental to development, sibling jealousy.

He found the commonest behavior disturbances were *early feeding problems* and the majority began during the first two years of life. A feeding problem arises when the feeding formula is a little too large. While the mother is still in the hospital, she should be made to realize that the baby is a better judge of the quantity he wants, and that she should not force feed when the baby is no longer eager. A more common time for the beginning of a feeding problem is when solid foods are first introduced. The mother should be advised at the time solid food is prescribed to "take it easy." She should be informed that it will require several days or may be even weeks before the child takes food enthusiastically, and that the only important thing is that he eventually learns to like it. However, most feeding problems commonly begin around the age of one year. The mother should be warned beforehand that the baby's appetite will fall off, and he will become more choosey and that she should not turn special dietary items into objectionable foods by urging. Let the baby go on thinking of food as always to be enjoyed and his nutrition will take care of itself. Occasionally after an illness the infant may not feel quite ready for cereal, and forcing food in the face of anorexia or illness creates a disgust reaction. The mother should be cautioned that it takes several days for the appetite to recover.

A story of a stormy battle over *weaning* will often be found in the past history of children with severe behavior disturbances, suggesting that the kind of resentment created by this particular struggle may be unusually long-lasting and bitter. The baby will show in various ways how ready he is for weaning from breast or bottle, and it seems fair that his readiness should be the main guide of parent and physician. Dr. Spock suggests a physician might summarize his discussion with a mother about weaning and thumb-sucking as follows: "Every baby is born with a strong instinct to suck. The intensity and duration of this instinct seems to vary in different individuals. We should consult about the time for weaning from the breast or bottle. One infant at nine months is bored with the bottle, enthusiastic about milk from the cup. He seems ready for gradual weaning; another at the same age, rejects the cup and shows deep devotion to the bottle. He may not be ready for fifteen months or later. Do not force for fear of making him balky or resentful. Urging may prolong his dependence on the bottle. Thumb-sucking in the early months suggests that the infant is not getting sufficient sucking satisfaction at breast or bottle. At the first sign, try to prolong the nursing time and retain frequent feedings. By the age of one year thumb-sucking appears to have become a comforter when the baby is tired, bored or frustrated. Constructive treatment consists in insuring that his life is as happy as possible, counting on him gradually to give up the habit as fast as he is able. In a persistent case, efforts to interfere directly seldom succeed, and may prolong the habit."

There is a widespread but unfounded belief that good health is acquired through metriculous regularity of *bowel movement*. In order to get the baby started early on this mythical road to health, it has become the style to put a lot of effort into and to take great satisfaction from early and rigorous toilet training. Often to the parent's despair training has broken down at a later stage of the child's development, and the child has resisted retraining until an abnormally late age. The psychoanalysts have felt that in certain individuals those over-vigorous training efforts created permanent distortions of the personality. Dr. Spock believes that the most important factors are how the mother goes about and how the baby feels about it during the second year. He is also of the opinion that a large proportion of the babies who resist training

come from the group who have had painful movements. This puts on the physician the responsibility of carefully preventing or curing all painful constipation throughout the first two years of life. What happens to a small child's personality in the course of a long struggle against training? First of all he is made unduly obstinate and hostile. This is an unfortunate influence at such an impressionable age, but worse than the hostility is the insecurity which usually keeps pace with it. The small child cannot consistently defy his mother without becoming uneasy and guilty and this throws his whole personality out of balance. Dr. Spock suggests summarizing a sensible discussion with the parent about bowel training as follows: "It is normal for many individuals to move the bowels irregularly. Do not try to change this as long as the movements are comfortably soft. Every child gradually acquires control of his bowel function and becomes willing to dispose of his movements in a way that is locally conventional. You do not need to become concerned about this process. It seems unnatural to do anything before the baby can sit up. It is important to keep his bowel movements soft so he will not dread defecation. When you begin to put him on the chair or toilet, do it casually and briefly. This means putting him on it at just the right moment, an easy job with a regular baby, but one calling for ingenuity or postponement of the whole program when the movement comes at any time of the day. Do not make it a moral issue. Between one and two years, it is normal for the baby to acquire a proprietary interest and pride in his movements. During this period he may show resistance to your efforts to capture his movements. He may object to going to the bathroom, or wait until he gets up to move his bowels, or become constipated. Relax your efforts gracefully until he feels more cooperative. Your persistence, especially if you resort to suppositories or enemas, will only increase his rebellion and distort his personality."

Control of the *urinary bladder* is gradually acquired by the child. By the age of fifteen months they usually have acquired enough conscious awareness of urination to comprehend the purpose of toileting if the mother has gone at it in a sensible way. Most children will still need to be watched and reminded into at least the first part of the third year. What are the causes of delayed control both day and night? First of all there is the

apparently wide variation between individuals in the maturing of the bladder function. Training itself, if it is done in the wrong spirit, sometimes works to postpone voluntary control. The child between one and one and one-half who is rigorously set down once an hour and kept there for long periods sometimes rebels against this unnatural imprisonment, and becomes firmly determined never to void in the proper place. This resistance shows up more often in prolonged night-wetting. At least in some individuals tension and uneasiness of many kinds seem to readily communicate to the bladder, rendering it less capable of relaxing and retaining urine. If almost any kind of emotional disturbance, small as well as great, can cause a child to relapse temporarily into enuresis, it is easy to see why a child who lives in a constant state of tension during his early years never has sufficient equanimity or inner relaxation to become dry in the first place. When the physician is consulted because a young child is still wetting his bed, the first question should be whether there are tensions operating to postpone the child's normal inherent progress to dryness. In one case the child needs only a little more time to feel at home in a new situation. In another, the friction between himself and his parents centers around a feeding problem. More commonly it is apparent that the mother's handling all day long is characterized by pushing, nagging and unnecessary interference. Occasionally, the only problem is that the parents are expecting perfect control at an age when a good proportion of children are still wetting regularly or intermittently. Certainly if the parents are going at the enuresis by intensive methods that are bringing diminishing returns these intensive methods should be called off. This is done not with the promise that this new technique will bring immediate success, but that in the long run it will work in the right direction. The new mother should be told that urine training is largely accomplished by the child himself, and that here the baby will, in the neighborhood of a year and a quarter, begin to retain his urine for about two hours at a time. In time, also, his bladder will learn to retain urine throughout the night. Inner security and emotional relaxation are necessary for this progress of bladder function.

Concerning *anxiety* in the early years, Spock finds that the fears of children shift with age. By a year babies are asked to show that they now realize that they depend upon their mothers for

comfort and safety. He believes that when the baby has reached the stage when he is no longer happy in his pen, and feels lonesome every time his mother leaves the room, it is wiser to let him out on the floor. By degrees he increases his independence. The infant at one is also apt to become much more suspicious of strangers. There appears to be a new phase of increased dependency between the ages of one and three-quarters and two and a quarter which makes the child more sensitive to any sudden or prolonged separation from the mother or any other close adult. Mothers should understand clearly that the young child, particularly up to the age of three, derives his greatest security from a sense of belonging intimately and irrevocably to his parents. Generally speaking, a mother should be discouraged from going to work during the child's early years, unless it is really essential from the point of view of finances, or of the mother's morale, or unless there is a relative, maid, friend, or foster mother to take her place who is familiar, loving, comfortable and can be counted on to last at the job, or unless there is excellent nursery school care to which the child is mature enough to adjust. All day group (nursery) care before the age of two and a half is generally unsatisfactory. First rate nursery schools have much to contribute, but because of the greater dependence of children up to two and a half to three, their introduction should be gradual and all day attendance should preferably be avoided. The three year old's imagination makes him apply all kinds of real and fantastic dangers to himself. Anxiety about his genitals is common, and often leads to preoccupied handling. The parents' efforts should be directed to understanding why the child masturbates, to reassuring him about his anatomy and to make his daily life satisfying and absorbing. It is better to say nothing to the child about the masturbation. But if they feel that they must say something, let them confine themselves to some remark such as "people don't think it is very polite."

It is a common belief that many severe behavior problems spring from a corrosive *jealousy of a new baby* in the family. Spock finds that jealousy is more intense when the older child is under five years of age and when the older child is the first in the family. One child becomes aggressive and vengeful; another loses all his joy in life and mopes disconsolately for months. It is better for

the child to know ahead of time that a baby is expected so that he can get used to the idea gradually. Most professionals in the children's field feel that the child should know that the baby is growing within the mother's abdomen, primarily because it is known that many children beyond the age of three suspect the truth anyway, through a combination of shrewd observation, slips in the conversation of adults and perhaps a touch of intuition. Some mechanical readjustments in the household are usually necessitated by the arrival of a baby. Whenever possible these should be made several months before the baby's birth and presented to the older child as evidence of growing up. It is vital, particularly when the older child is in the neighborhood of two years, that he feel comfortable and secure with the adults who will care for him while his mother is in the hospital. Also, if possible, the older child should be off on an excursion when a new baby comes home from the hospital, and come home when his mother is able to give him her undivided attention. When the baby is at home, the first principle is to play down the importance of the baby. This means talking about the new baby as little as possible, enthusing over him as little as possible and taking care of him casually when the older child is around. There is also value in letting him share in the ownership and care of the infant. It will help the parents to know the different forms that jealousy may take. Everyone knows what it means when a child grabs a heavy object and hits the baby over the head with it. But many think it is clumsiness when the child hugs the baby with an embrace which begins gently, and ends with a grip which brings a squawk from the infant. One child turns all his resentment against his mother, and grimly empties the flower pots on the living room rug. Another loses all joy in his usual pursuits and follows his mother from room to room sadly sucking his thumb. Children frequently revert to wetting by night and by day, and some even soil themselves, for which there are several explanations. There is the element of defiance; there is the desire to receive the same tender care by imitating a baby. But it must also be realized that a severe unhappiness without the elements of resentment or imitation may lead to a dramatic regression to infantile behavior.

Since the greatest possible opportunity for practical mental

hygiene lies in the rearing of children, let us look at the four outstanding misconceptions pointed out by Knight,[7] which lead well-meaning parents and teachers into serious errors with the children they are trying to make good citizens.

1. The belief that everybody knows enough about human nature and "psychology" to rear children to advise others on all human difficulties, and to "handle people" if he just uses "common sense." "Common sense" is too often the sum total of that individual's own particular experiences and attitudes, narrow vision, collected clichés and misinformation.

2. The tendency to react to one's own rearing either by copying exactly the disciplinary methods used by one's own parents or else by swinging to the opposite extreme. However, neither slavish imitation nor equally slavish avoidance of the old folks' tactics is a sound basis for bringing up a new generation.

3. The belief that children should be as little nuisance as possible. According to this theory, the child is, or at least should be, a "little adult" as quickly as one can intimidate him into being docile, clean, quiet and obedient. The home is to be a place of order and quiet, with no messes, and no bedlam of children's noises. Many teachers have the same ideas of managing children. Reduction to a minimum of the annoyance of having the "brats" around can be nicely rationalized into instilling good habits early.

4. The attempt to follow the precepts supposedly emanating from the "new psychology." The parents sometimes falter and become bewildered and inconsistent, due to their multiple shifting of the course of discipline after hearing or reading each new idea. Basic principles are missing, and polar opposite methods are simultaneously employed. Having heard that the great danger in bringing up children is causing inhibitions to develop in them which will cripple their lives, they use no discipline, no punishment, no restraint, and rear play boys, delinquents and psychopaths. Having heard that parents should be pals to their children, they abdicate their authority as grown-ups and parents, sacrificing their dignity and their children's respect in a strenuous but futile attempt to be contemporaries of their children. Having heard that love is the most important thing to give a child, they give a hovering, over-protective, managerial devotion that is both smothering and devitalizing.

Problem behavior in children represents the result of mishandling by parents of behavior that originally was within normal limits, or the reaction of children to certain traumatic attitudes or conditions in the home, or the effect of certain unfortunate experiences outside the home—or some combination of these. Problem behavior may indicate that character development is proceeding in an abnormal direction, or it may mean that some kind of neurotic or psychotic illness is developing. Competent professional advice is essential and treatment of the child, in addition to revised methods according to the advice given, may be necessary.

Knight,[7] in a bulletin of the Menninger Clinic, gives a fairly comprehensive list of the *most common disturbances* with some comments about each one.

1. *Temper tantrums.* These are usually more or less calculated, intentional, emotional outbursts by a child to gain a point against the parent through a method found to be effective in the past in influencing the parents to relent in some adverse decision. The obvious answer to this would be for parents never from the beginning to be influenced into changing a decision by such behavior. Instead, they should meet the behavior firmly, adhering inexorably to the decision made, banishing the child to his own room for cooling off, or, if that doesn't work, administering a spanking then and there. Its occasional appropriate use may be an essential part of firm, consistent discipline.

2. *Childish tyranny.* Refers to demanding behavior, insolence and defiance in a child who is also usually over-dependent. Consistently refusing to accede to the child's importunate demands, insisting that the child do the things he can do for himself, would have prevented such behavior from developing in most instances. A change to consistent discipline while the child is still small will usually bring such tyranny to an end.

3. *Timidity and fearfulness,* with associated anxiety spells, nightmares, fears of being away from home or away from mother, may be due to too much parental strictness, usually combined with doing too many things for the child that he should be learning to do for himself—feeding, dressing, bathing, finding his things. His decisions are made for him, and he has but to appear helpless to get his mother to do things for him. Occasionally temper tantrums and childish tyranny may be combined with the timidity.

To maneuver him out of such a childhood neurosis, the fears and resentments must be uncovered and dealt with by a child psychiatrist, and at the same time the mother's attitude must be changed by appropriate education and advice.

4. *Apathy, indifference, isolation, inattention and day-dreaming* are rather ominous signs at any age, but especially in childhood are they alarming, because a healthy child is eager, energetic, curious and alert. Such symptoms represent a kind of withdrawal from the real world of childhood into a fantasy world, and foreshadow a developing mental illness unless skillful therapy can draw the child out into normal interests again.

5. *Overobedience, compulsive neatness and perfectionism* represent a set of reaction formations to rebellious defiance and while such attitudes may please the indiscrminating parents, trouble usually lies ahead. Such ideals are very difficult to sustain, and failure or frustration is almost inevitable. A child with such trends will tolerate failure very poorly, with consequent depression, hopelessness and self-destructive tendencies. The parent can help by not pushing the child further in this direction through over-ambitious expectations and plans, but psychiatric help may be needed to relax these "too good" tendencies.

6. *Cruelty, bullying and over aggressiveness* may develop out of resentment for the imagined favoring by the parent of a younger sibling, or as a result of the child's feeling he is treated in a cruel rejecting manner by his parents. Aggressive behavior of this kind usually covers many fears and feelings of insecurity. More affectionate management of such a child and taking into account his possible distress at seeing his youngest sibling receive care and attention, may be sufficient to alter his aggressive attitude. If not, psychiatric consultation should be sought.

7. *Running away from home or school,* where it is not due to real mistreatment, justifying such an attempt to escape, may represent a desperate attempt to be independent, to deny the strong need for affection and support from adults. Such behavior is more frequent in adolescence or a late-preadolescence and is usually quite abortive in younger children to rather quickly and gladly return home after feeling impelled to carry out a threat to leave home.

8. *Frequent accidents and injuries* may indicate a considerable

degree of unconscious guilt with need for self destructive punishment. This refers only to those repeated injuries which begin to make one suspect that some purposive tendency exists in the direction of self-injury. A close inspection of the relationship between the child and both parents as well as between the siblings or among the child's playmates, may disclose the source of the guilt feelings which are being paid off in this way. Usually this is a transient phase in a child.

9. *Sleep-walking which persists well into the teens* requires psychological investigation to discover and make conscious the impulses and desires being acted out in sleep. Hypnoanalysis is often effective in such cases.

10. *Lying* usually develops out of childhood fantasies which are either ignored by the parents, or over-reacted to by them with violent attempts to establish truthfulness. Sometimes a child finds that skillful lying gets them into less trouble than telling the truth. Persistent lying, especially needless lying, up to and past the age of ten, is usually accompanied by other types of problems behavior, pointing to developing delinquency or mental illness. Treatment in a psychiatric school may be indicated, if advice obtained from a psychiatrist and followed consistently by the parent is ineffectual.

11. *Stealing* may result from external influence of companions, but this source is probably over-emphasized, for such tendencies must be already present for the external "bad influence" to have any effect. Failure to start early teaching a child how to handle money by giving him an allowance, paying him for special work done, and letting him buy what he wants with what he has, is undoubtedly related to stealing tendencies. Children of four or five should be getting a regular allowance and taking care of their own small sums. If, instead, a parent makes a child ask for money each time he wants something, continuing this into adolescence, there develops a great temptation to steal—first from parents, and later from other people. Of course, factors in the home ideology, such as attitudes of the parents about honesty, the family economic status, and group influences in the neighborhood play a part in many cases.

12. *Persistent thumb or finger-sucking beyond infancy* indicates that the child has come to depend upon this device for soothing his

anxiety. Thumb-sucking in infants indicates that the child is not getting enough satisfaction of sucking in nursing at the bottle or breast. No direct steps should be taken in infancy beyond increasing the time at the breast or bottle, and giving the child more affection. If this does not suffice, pulling his fingers out of his mouth after he is asleep, then waiting to pull it out again if he puts it back and continuing this consistently, may stop the habit. If the cooperation of the child can be enlisted in trying to stop, no punishment being given for failure, but praise being freely given for success, the difficulty can rather quickly be brought under control.

13. *Nail-biting* also represents a way of reducing anxiety, and may evolve out of earlier thumb-sucking. Similar methods as those described above should be tried. In girls, the cosmetic appeal is often effective.

14. *Persistent enuresis or soiling after the age of three* indicates a psychosexual conflict of considerable degree. Any child may have some occasional relapse in wetting or soiling, especially in reaction to some disturbing event, such as the birth of a new baby, a death in the family, separation of the parent, being left with a nurse while the parents take a trip, and so on. But persistent wetting or soiling, in the absence of such special traumatic events, requires careful scrutininzing of the whole setting and all the child's relationships by a competent child expert. Punishment or shame by the parents should never be done, but control of fluid intake after the evening meal, getting the child up again when the parents retire, and praise for a dry night may be sufficient.

15. *Excessive or open masturbation* refers to almost constant handling of the genitals, sometimes done in the presence of others while seemingly oblivious to their presence. One would almost certainly find other disturbances also in such a child—perhaps apathy, distractibility and states of preoccupation. Punishments and shaming are again contraindicated, and the underlying conflict should be sought with the help of a child psychiatrist.

16. *Fire-setting in children* can develop into a serious matter and requires prompt management. Invariably other behavior disturbances and psychosexual conflicts will be found to be present. Psychiatric advice should be sought, and a complete psychological

examination should be done, followed by the type of treatment and management indicated.

Knight urges that education for parenthood should be incorporated in the curriculum of secondary schools and colleges. Courses in mental hygiene and dynamic psychology should include sound psychologic principles of child rearing, so that this enormously important factor in the future mental health of the new generation is not left to chance, ignorance and the parent's own "common sense." Similar courses for prospective teachers outrank in importance the instruction in teaching subject matter.

Children, in the vast majority of instances, will develop normally if the following conditions are present:

1. Consistent, real affection from both parents so that the child feels wanted and secure. Such real affection will mean that the parents want the child to develop independence and have individuality and right.

2. Consistent, firm, united discipline from both parents, carried out with reference to the child's needs, rather than to parents' comfort. All children need such parental disciplinary restraint, and to protect them from feeling anxious and helpless in relation to their own instinctual drives.

3. Sufficient understanding of, tolerance of, and ability to identify oneself with children to permit sensing what the child needs and what he is trying to accomplish by his various struggles and technique. A few persons seem to develop this naturally as a product of their own experience and psychological-mindedness; others need to read and study intensively in order to be adequate for their parental responsibilities.

4. Willingness on the part of the parents to seek counsel and help from competent child psychiatrists when problems arise, which are beyond the parents' understanding.

The medical profession has reason to be proud of the great strides the pediatricians and the psychiatrists, working hand in hand, have made in the last few years. In reviewing the literature one is immediately impressed by the honest sincerity of the writers.

However the literature does not seem to stress the importance of religion. Are we to assume, then, that religion plays no part in general psychiatry?—that religion plays no part

in child psychiatry?—that religion is not to be considered in the rearing of mentally healthy and morally sound adults?—are we to assume that religion or lack of religion has no bearing on childhood personalities?—where is the child to turn if no goal—no inspirations are held up before him and no restrictions imposed on his actions? Who is to challenge the statement "religion should permeate all our actions?"

Another important consideration that seems essential to a child's mental health is sex education. It is agreed by most that sex education is necessary. The question however, is "in what form should it be presented," and "by whom," and "at what age." It is safe to assume that a good moral upbringing is the best prevention against any forms of sexual aberration. The right and duty of imparting sound principles rests mainly with the parents. Definite sexual instruction should only be given by those for whom the child or young person has respect and reverence, preferably by parents. Only when there is such respect can the instruction be impersonal in the sense that the young person does not associate sexual passion in any way with the person imparting the information. It is very important that there should be no association of this kind in the mind of the child or young person. If this instruction remains undone serious moral and neurotic effects may follow. The first and fundamental rule (regarding instruction in sexual matters) is that instruction in sex must be individual, and that there must not be any sex talk to classes or groups of children or adolescents and that this individual sex instruction should not be a solemn and guarded special talk. The matter should be made to appear to the young person as a very ordinary one. The "ordinariness" of the subject should be kept in mind by those who have to talk to the young about it, as their own mentality will influence what they say and their manner of saying it.

It is necessary to give some information on sex when children begin to ask questions. No matter how young the children are, they should never be told lies, though this does not mean that they should be told all the truth or even given anything in the way of detail. The form the answer should take must be left to the prudence of the person interrogated. Children below the age of puberty should ordinarily be given only a very general answer. With such children, if they are very precocious, and with children

who are somewhat older, it is necessary to impress upon them that there is no mystery being withheld from them and to convince them that it is best for them to wait till later for fuller knowledge upon these matters. To such remarks the grown-up who has been questioned, especially when the child asks questions about itself rather than about procreation, should tactfully add something about the reverence which we owe to our bodies and the beauty of modesty. This reverence and modesty is required by man's rational nature ....." Care must always be taken not to offend the child's natural sense of modesty. Sometime after the age of fourteen or fifteen it will be necessary to give detailed information. This depends principally upon the precocity of the young person or the definite necessity of imparting information. It should be remembered that human nature cannot be adequately dealt with by rule of thumb, and that only long experience can equip one to bring abnormal cases back to a normal outlook. The inexperienced must remember that no advice is better than bad advice, and that prudence is of paramount importance.

SUMMARY

The purpose of this paper is to give a brief description of the invasion of psychiatry into the realm of pediatrics; to give the reader a clear cross-sectional picture of what currently is in the literature concerning the development, avoidance and treatment of behavior problems; to reimpress in the reader's mind the great role the parent, the teacher, the general practitioner and the pediatrician have in the prevention of abnormal mental habits; and last, but not least, to bring to the attention of medical students the origin in recent years of a new and important branch of medicine, that of child psychiatry.

REFERENCES

1. Kraines, S. H.: Preventive Psychiatry. Am. J. Psychiat., 104: 238-241, Oct. 1947.
2. Veeder, Borden S.: Child Behavior Problems and the Physician in Practice. Am. Pract., 1: 37-40, Sept., 1946.
3. Menninger, Karl: Pediatrics and Psychiatry. Bull. Menninger Clin., 8: 167-169, Nov. 1946.
4. Senn, Milton, J. E.: Relationship of Pediatrics and Psychiatry. Am. J. Dis. Child., 71: 537-549, May 1946.
5. Allen, Frederick H.: Training in Child Psychiatry. Am. J. Orthopsychiat., 16: 430-439, 1946.
6. Spock, Benjamin: Avoiding Behavior Problems. J. Pediat., 27: 363-382, Oct. 1945.
7. Knight, Robert P.: Behavior Problems and Habit Disturbances in Pre-adolescent Children. Their Meaning and Management. Bull. Menninger Clin., 8: 188-199, Nov. 1944.

PEDIATRICS HALF A CENTURY AGO

From time to time the Archives, which was the first Children's Journal in the English language, will reprint contributions by the pioneers of the specialty over fifty years ago. It is believed that our readers will be interested in reviewing such early pediatric thought.

THE ETIOLOGY OF RACHITIS*

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In the following paper I wish to summarize briefly some experimental work which has been carried out to determine the cause of rickets, and to refer to some collective observations made by me on three small groups of infants from hospitals and tenements in New York, and finally to discuss the conclusions that may be drawn from these.

Although the disease has been recognized and studied for 250 years we are still very much in the dark as to its etiology. It was first described by Whistler in 1645 and was first called to general attention by Glisson's description of the disease in 1650. In the nineteenth century a more careful study of the disease was made with very extensive experimental work on animals.

In considering the etiology of rachitis we must agree that it is not a disease of the bones alone, but a general disease affecting the bones, ligaments, muscles, nervous system and mucous membranes and that the earliest symptoms of the disease, the sweating of the forehead and the restlessness, as indicated by a bald spot on the back of the head, are often unaccompanied by evident bone lesions. Although rachitis is said to occur between the sixth month and second year it is my experience that it is often fairly developed before the sixth month. That is, before that time the signs of craniotabes, the bald spot on the back of the head, the sweating of the forehead, and the rosary may be observed.

The theory of Parrot that rachitis is always of syphilitic origin is not advocated at present. A deficient supply of oxygen seems to be an important cause of rickets or, as we may say, climate is an important etiological factor. Rickets being essentially a disease of

*Read at the Fifteenth Annual Meeting of the American Pediatric Society held at Washington, D. C., May 12-14, 1903.
Reprinted from ARCHIVES OF PEDIATRICS, 21: 250-260, April 1904.

temperate and cold climates and almost unknown in hot climates, where people do not shut themselves up in close rooms, naturally those who suffer most in our temperate climates are those who come from hot climates, as the negroes and Italians. There is no doubt but that rickets is much more common in this country in Italians and negroes than in foreigners from northern climates, and our worst cases of rickets are seen in these people and especially in the negroes. The frequency of rachitis in certain temperate and cold climates is shown in the following observations.

In Russia, Ionkowsky states that 95 per cent of the infants show slight lesions of rickets, while 35 per cent show severe lesions. In Norway, Johannessen considers that 32 per cent of the children of his clinic have rickets and that the cases are seen most frequently in April to June, and least frequently in November and December. In Boston, Morse found that 80 per cent of the infants at his dispensary class showed rickets. In Greece, Algiers, Peru, Mexico, and India and other countries with warm climates, this disease is said to be seldom or never seen.

Rickets is, moreover, a disease of the cities and is much less frequent where people live less closely. Indeed, it has been suggested that rickets is a carbonic acid poisoning, but this theory has lacked support. That cold climate and the accompanying bad air of closed and close rooms is alone a sufficient cause of rickets I do not believe, but undoubtedly unsuitable food will produce rickets more rapidly when the child receives an insufficient supply of oxygen. It has thus been stated by several observers (Kassowitz, Wallach in Munich, Mey in Riga and Bystrow in St. Petersburg) that rickets occurs more frequently in winter than summer. Although race and climate may predispose to rachitis the active cause seems to exist in the diet.

The determination of the exact cause of rickets would seem to be rendered more simple by the fact that this disease may be produced in most of the lower animals, but in examining such series of experiments we find few consistent or conclusive results. When it was known that the bone lesions of rickets showed a deficiency of lime salts the theory was at once advanced that the deficiency of the salts in the food was the real active cause of the disease. It was indeed found by Chossat that by withholding lime salts from the food a softening of the bones resulted but a typical rachitic condition was not produced. Moreover, cow's

milk contains more lime salts than mother's milk and again rickets is very common in places where there is much lime in the water. Another modification of this theory is that the trouble is in the failure of the system to absorb the lime salts (Henoch and Baginsky), but observations on the elimination of lime salts in the urine of the rachitic and normal subjects showed no difference. It has been further held by Pommer that, although sufficient lime may be fed and absorbed, it may not be deposited in the neoplastic substance on account of diminished alkalinity of the blood, but it has been shown by Stoeltzner that the alkalinity of the blood is not diminished in rickets.

Again the lesions of rickets have been attributed to the presence of lactic acid in the system or, as is held by Monti, an excess of lactic acid in the stomach with a lessened amount of hydrochloric acid. This lactic acid theory may appeal to us because of the fact that many of the foods which seem to produce a severe type of rickets contain starch which may produce lactic acid in the stomach and, also, on account of the large content of lactic acid and lactic acid bacteria in some market milk. Extensive experiments on animals by many observers, consisting in the injection of lactic acid, have failed almost always to produce rickets. Spellman injected a rabbit for a month and a half with 10 cc. of a 1-200 solution of lactic acid without producing any bone lesions. On the other hand, rickets occurs in animals on a diet which does not lead to the development of lactic acid. Guerin fed young animals on meat instead of mother's milk and they developed rachitis. In the London Zoological Gardens more than twenty litters of lion cubs, which had always been fed on meat, were lost from the development of rickets. At last one litter with advanced rickets was seen by Bland Sutton who advised for them milk, powdered bone and cod-liver oil with meat. They were left with the same environment but in three months they showed no signs of rickets. These animals were thus dying from rickets on a diet of proteid, only of a sort rather difficult of digestion, and were cured by a diet of more digestible proteid with fat. And this leads us to inquire whether the absence of fat in the food may not be an important factor in the production of rickets.

Clinical experience has convinced many of us that much of the severe rickets is produced by feeding with proprietary foods

and condensed milk, both of which are very poor in fat. Thus, while mother's milk contains usually 3 to 4 per cent of fat, and two to three times as much fat as proteid, we find in the ordinary condensed milk less fat than proteid, and in the pulverized proprietary foods from one-fourth to one-fourteenth as much fat as proteid.

Experiments were undertaken by Dr. Herter, of New York, to produce rickets in pigs by fat starvation. One pig was fed fifty-one weeks on a limited quantity of Walker-Gordon skim milk containing 1/40 per cent fat, while sow's milk usually contains 8 to 10 per cent fat, so that the pig received only 1/300 to 1/400 the normal amount of fat. During the fifty-one weeks the pig gained 16 pounds. It, however, became constipated, weak and its skin became dry and it was drowsy. It was moribund when killed. Another pig was fed twenty weeks on an unlimited quantity of the same food. It also developed muscular weakness and drowsiness. A third pig was fed fifty-six weeks with skim milk and carbohydrates. This pig developed the muscular weakness and had occasional diarrhea. Other pigs were also used. As a result of the experiments and autopsies on the pigs Dr. Herter concluded that fat starvation in pigs does not cause rickets, no rickety lesions in the bones of these pigs being evident. The most peculiar discovery at the autopsies was the presence of mucoid degeneration, which replaced the fat of the adipose tissue. This mucoid degeneration did not, however, occur in the animals that received an excess of carbohydrates.

It thus seems fortunate that these canned foods for babies contain usually an excess of carbohydrates, since by analogy this fact may have saved the babies fed on them from a mucoid degeneration of their adipose tissue, although subjecting them to fat starvation.

Delcourt, in 1899, held that the lesions of rickets could be produced in animals by the action of phosphate of potash and that he had produced them by the administration of phosphate of potash to dogs. Spellman repeated his experiments. He gave to seven rabbits for a month daily doses of 2 to 5 grams of phosphate of potash. To a young pig he gave 700 grams of phosphate of potash in twenty days. To another rabbit one month old he gave for several days subcutaneous injections of 5 to 50 cc. of a 5 per cent

solution of phosphate of potash. All the animals were killed and showed no macroscopic or microscopic evidence of rachitis.

Spellman, although having failed in obtaining positive results, believed the lesion due to some irritation and thought it most likely that such irritant had its origin in the gastrointestinal tract. In order to determine whether intestinal poisons would cause the lesions of rickets he made repeated injections into twenty rabbits and one cat of extracts of the diarrheal stools of rachitic infants, and in only one of these animals, a rabbit, did he obtain evidence of rachitis. Experiments in feeding animals on the colon bacilli, and others in injecting their toxins, also failed to produce rachitic lesions. The inoculation of cultures of the staphylococcus and in other experiments of their toxins gave negative results. The toxins of the bacillus pyocyaneus gave a like negative result. Morpurgo, however, states that by injecting into young rats a pathogenic diplococcus he obtained typical rachitis. Efforts made by Spellman to isolate a specific etiological organism from the intestine of rachitic infants have also proved unproductive. The theory that intestinal toxemia is the cause of rickets is opposed by Kassowitz who calls attention to the fact that intestinal toxemias are a summer disorder, rickets a disease of winter. In like manner the bone of rachitic infants has been found to contain the same organisms as the bone of nonrachitic infants. The inoculation into healthy animals of bones removed from rachitic infants have in 5 cases given negative results. Notwithstanding his 126 failures and one positive result Spellman is not discouraged and is still pursuing his investigations.

In considering all this experimental work one must remember that one positive result is of the greatest value; while negative results, although of great value for reference in future experiments, should not produce much influence on our opinions, and especially we should not apply to children any deductions from experiments on animals which gave negative results. This statement is well supported by experiments of Spellman in which he subjected various animals to the combination of the conditions we believe to produce rickets in babies: poor air, poor light, defective forms of food, etc., so that in all ten died from gastroenteric disorders in from one to four months, but not one showed any sign of rachitis.

If then we review the positive results of these experiments we

must reject those of Delcourt in which phosphate of potash was administered, since they lack confirmation, although repeated by Spellman. Morpurgo obtained positive results in rats from the injection of a pathogenic diplococcus. There is, however, no confirmation of this observation.

Spellman in one experiment obtained rachitis from the injection of extracts of the diarrheal stools of rachitic children. Bland Sutton found that young monkeys deprived of mother's milk and fed on vegetables and fruit became rickety. Two young bears fed on rice biscuits and raw meat had extreme rickets. A lion whelp weaned early and fed on milk developed rickets. The lion cubs already mentioned, fed on raw meat, developed rickets on meat and were cured on milk, ground bones and cod-liver oil. It would seem from a consideration of these positive results that rickets may be produced by an improper food which may be too difficult of digestion or contain too little sugar and fat or too much starch. Also we have evidence that certain bacteria, perhaps intestinal or intestinal toxins, may produce rickets.

Comby, of Paris, considers rickets infrequent in infants nursed at the breast and in support of this statement notes, that in China, Japan, India, etc., rachitis is unknown. These countries to a great extent have in common another factor, a warm climate. Rickets does occur in breast-fed infants and efforts have been made to determine the defects in the mother's milk which produced the rickets. These analyses, however, have been made naturally after the child had well-developed rickets and were thus not analyses of the milk on which the child first developed the disease. Pfeiffer made seventeen analyses of mother's milk supplying 8 cases of rickets. He found no variation in this milk, in fat, proteid or sugar, from that supplied to other infants who did not develop rickets. He found, however, the phosphoric acid diminished one-half in some of the milk furnished the rachitic children but the change was not constant. These observations of Pfeiffer are so far as I know unconfirmed.

The following clinical observations have been made in New York:

Dr. Eli Long examined in December, January and February, forty-six babies in the tenements of New York, varying in age from one to nine months with an average age of six months. These babies were fed on all sorts of food, breast milk, modified

milk, Straus' modified pasteurized milk, condensed milk and some on proprietary foods. Among these forty-six babies, many of whom had dirty and unhygienic surroundings, he found only 7 or 15 per cent with marked rickets. Three of these were colored (there were only five colored children observed), and one an Italian (the only Italian child observed); of these 7 cases 3 were fed on condensed milk, one on condensed milk and breast milk, 2 on modified milk and 1 on modified milk and breastmilk. The small proportion of cases of rickets observed by Dr. Long may be accounted for by the early age of some of the children and by the fact that only marked rachitis was noted.

Of twenty-one infants varying in age from two to sixteen months and averaging eight months, carefully examined by Drs. Long and Steele, during April at the Pediatric Clinic of the University and Bellevue Hospital Medical School, they found that six showed evidence of rickets, mostly slight, or about 28 per cent. These children were from the tenements and represented the same class as those in whom in Boston, Dr. Morse found that 80 per cent had rickets.

I have carefully examined a number of children in two institutions for the care of children in New York. In one of these institutions I examined sixty-six babies varying in age from one to twenty-four months with an average age of eight months. The babies are in large nurseries with ample light and well ventilated during the day. These children are nursed, one woman supplying the milk for two babies. In addition, twice a day, the babies under four months of age receive a condensed milk mixture consisting of a one-eighth dilution of condensed milk with 3 per cent of cane sugar added, so that the food apparently represents about, fat .9 per cent, cane sugar 9 per cent, proteid 1 per cent. Between three and six months they receive in addition to breast milk a condensed milk mixture with bread crumbs soaked in it which I have figured out to represent about fat .8 per cent, cane sugar 10½ per cent, proteid .9 + starch. Of these sixty-six babies, 23 or about 35 per cent were noticed to sweat about the forehead; 50 or about 76 per cent had a bald spot on the back of the head; 40 or 62 per cent had coated tongues, and 1 had a geographical tongue. Of eighteen children of eight months or more of age, only 3 or 16 per cent showed marked delay in dentition.

Of the sixty-six babies, 60 or about 91 per cent had an evident rosary; in 20 it was small; in 33 it was of fair size; in 7 it was large; in 7 the epiphyses were large; in 38 or 57½ per cent there was the distended abdomen known as pot belly; in 28 or 42 per cent this was associated with a small flaring thorax, giving the familiar appearance in rickets of a small thorax and large abdomen; 30 or about 45 per cent showed craniotabes; 22 or 33 per cent showed an anterior fontanel that was larger than normal.

It is interesting to note that the nineteen children in one of these nurseries that had been having whooping-cough showed no more evidence of rickets than those that had been free from this disease. In this institution with good general hygiene and immaculately clean, of babies fed for the most part on breast milk but supplemented twice a day by a condensed milk mixture representing the formula—fat .9, cane sugar 9 per cent, proteid 1 per cent, 91 per cent showed evidence of rachitis.

On undertaking to examine children in another institution, where modified milk feeding is used, I noted first the condition of thirteen infants which had been received from the tenements, within a few days. They were rather young, varying in age from three months to nine months and averaging four and one-half months of age.

Of these thirteen children: none showed sweating; 10 or 77 per cent bald spots; 7 coated tongue; 9 or about 70 per cent, rosary, 6 small, 2 moderate in size; 6 or 46 per cent pot belly; 3 or 23 per cent small thorax and large abdomen; 2 enlarged bosses; 1 craniotabes. Of five of these babies fed on condensed milk all had rosaries; of 3 fed on modified milk one had rickets; of 2 fed on modified milk with gruels both had rickets.

Twenty-five children in this institution who had not been recently admitted, varying in age from three months to nineteen months, and showing an average age of ten months, had all been fed on modified milk.

Of these twenty-five children, 5 or 20 per cent showed sweating about the forehead; 14 or 56 per cent bald spot on back of head; 13 or 50 per cent coated tongues. Of 15, 8 months and over in age, 7 or nearly 50 per cent showed marked delay in dentition.

Of the twenty-five children, 22 or 88 per cent showed a rosary;

3 showed enlarged epiphyses; 11 pot belly; 8 small thorax and large abdomen; 3 craniotabes.

On comparing these statistics, we find that the tenement house children make a much better showing than those in hospitals, even when the hospital babies are for the most part breast-fed, and here we have data apparently at variance with the accepted ideas, for in one group of hospital babies we have ample light, good air, cleanly surroundings and mostly breast milk, with 91 per cent rosaries; while the tenement house babies with bottle-feeding show only 70 per cent rosaries. We cannot then agree with Morse, who examined for rickets 318 dispensary babies in Boston, and concluded, after a careful study of the nationality and food, that they had only one influence in common, and that was unhygienic surroundings.

CONCLUSIONS

1. Experiments on animals would seem to indicate that unsuitable food is capable of producing rachitis and that possibly certain bacteria or intestinal toxins may produce a similar result.

2. The clinical observations are too limited for any positive deductions, but are interesting inasmuch as they indicate less rachitis in the tenement than in the institution children fed on modified milk, and the greatest amount of rachitis in institution babies fed on breast milk with auxiliary feedings of condensed milk.

PHOSPHATE TOXOID IN PROPHYLAXIS IN DIPHTHERIA. (Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam, 93: 4014, Nov. 26, 1949). Noordam and his co-workers say that the phosphate toxoid prepared by the Institute for Public Health in Utrecht consists of a diphtheria toxoid prepared by ultrafiltration and extraction with ammonium sulfate and adsorbed on aluminum phosphate. This new toxoid (phosphate toxoid) was tried in 67 adults, who were given either two injections of 0.5 cc. each or one of 0.5 and one of 0.2 cc. Sixty-four of these persons were completely immunized. Reactions were slight. The phosphate toxoid was used in Amsterdam in two groups of children, numbering 154 and 73. Immunization was successful in 151 and 72, respectively, that is, in more than 98 per cent. The reactions were slight.—*Journal A.M.A.*

CLINICAL-PATHOLOGICAL CONFERENCE

WILLARD PARKER HOSPITAL, NEW YORK

Meeting held April 18, 1950

DR. JOSEPH GOLDSTEIN, presiding.

PRODROMAL MEASLES. INTERSTITIAL PNEUNONIA

DR. GOLDSTEIN. Before we discuss the cases, Dr. Dolgopol will present the gross findings:

1st Case. No. 1551. The body was that of a well-developed, well-nourished white girl three years of age. The skin showed a few discrete brownish petechiae over the chest, abdomen and arms. Otherwise the skin and mucous membranes were pale. The liver was two finger-breadths below the costal margin, congested, firm, but friable. The spleen was moderately enlarged, congested, the pulp scraped moderately. The heart also was moderately enlarged, with firm myocardium and normal valves. The lungs were congested, moderately edematous, with a few deep-red areas which appeared slightly depressed, but otherwise appeared to be air-holding. The Peyer's patches of the small appendix were rather prominent. The brain weighed 1280 grams. The meningeal vessels were moderately congested, but the brain tissue was pale on section. The kidneys were somewhat enlarged, the adrenals appeared normal.

2nd Case. No. 1913. The body was that of a well-developed, well-nourished colored boy two and a half years old. The head was opened first. The meninges were moderately congested. Cloudy fluid was present in the subarachnoid space. The convolutions were flattened. A few tiny whitish spots were seen in the meninges over the convexities. At the base of the brain and on the median aspect of the right hemisphere several larger tubercle-like structures were seen. There was a cloudy fluid at the base of the brain, around the chiasm and in the interpeduncular space. (Smears from that fluid later were found to contain acid-fast bacilli.) The heart was somewhat enlarged but firm. A mass of matted caseous lymph nodes was present on either side of the trachea and in the hilar regions. A firm area of caseous pneu-

monia, at least 3 cm. in diameter, was present in the right upper lobe. Tiny, pin-point-sized tubercles were seen in the rest of the lung tissue, in the spleen, beneath the capsule of the liver and in the kidneys.

Clinical History. Dr. Anderson presented Case No. 1551. This three-year-old white girl was admitted to Willard Parker Hospital on March 10, 1950, at 5:00 P. M., with a history of three convulsive episodes associated with fever and infections during the preceding two years. She had been hospitalized for six days for bronchopneumonia about six weeks before admission to this hospital. She had been well until the day before admission here. She seemed tired and had a temperature of 102° F. She was put to bed and given aspirin. Her temperature rose and she had a convulsion which lasted one and a quarter hours in spite of "injections" given by her family doctor. She had not regained consciousness and on March 10, 1950, was sent to this hospital. On the way, she became cyanotic and broke into a cold sweat.

During admission she was comatose, cyanotic and in shock. Her breathing was labored and stertorous. Rhonchi were heard throughout her chest. Scattered petechiae were noted on her skin. Ear drums and pharynx were inflamed. No meningeal signs were found. Temperature was 104.2° F. Lumbar puncture yielded normal spinal fluid. Blood count: 31,300 cells, 90 per cent polymorphonuclears. Blood was taken for culture.

A cut-down was done and fluids administered. She was given adrenal cortex extract, penicillin, streptomycin, sulfadiazine and was kept in an oxygen tent and suctioned frequently. Her color improved following the above measures, but she remained comatose and her breathing was still rapid and noisy. Her heart rate was rapid and a precordial systolic murmur was heard. The child's condition remained largely unchanged during the following day. No new petechiae were noted, occasional twitching movements of her extremities were seen. On March 11, 1950, a gram-negative organism, suggestive of meningococcus, was found on smears from her blood culture. Streptomycin was cut.

That evening the child looked moribund and her temperature reached 106.2° F. She expired at 4:40 A.M. on March 12, 1950.

Microscopic Sections of Case No. 1551 were shown. The walls of the alveoli in both lungs were thickened, especially around the

bronchi, and contained many mononuclear cells. Several small areas in both lungs were atelectatic and showed fibrin, macrophages and rare polymorphonuclears in the lumen. The myocardium showed interstitial edema. The liver showed areas of swollen, degenerated Kupffer's cells, with loose polymorphonuclear collections in the sinusoids. Several giant cells of measles type were found in the spleen, accessory spleen, thymus, in one lymph node and in the lumphoid tissue of the larynx and small intestine. In the brain, several small cuffed blood vessels were found in the white matter of the cortex, in the hippocampal region and in the gray matter and white matter of the striate body.

On the basis of the presence of giant cells of "measles" type in several lymphoid organs, the diagnosis of prodromal measles appears to be probable. Interstitial pneumonitis also occurs in measles. Encephalitis, too, is known to occur in the prodromal stage of measles.

DR. GOLDSTEIN. You base the diagnosis of measles on the giant cells?

DR. DOLGOPOL. Inasmuch as we are not equipped for virus studies, we have to rely only on morphological studies. Giant cells of the type seen in the lymphoid tissue of this patient do occur in measles, so it seems likely that we were dealing with a case of measles.

Clinical History. DR. BAKSHANDEH presented Case No. 1913. This two and a half year old colored boy was referred from another hospital on March 24, 1950, to this hospital. He had cough, fever and anorexia for about six days. A rash was also seen, suggestive of scarlet fever. The child was then sent here with a diagnosis of scarlet fever.

On admission his temperature was 104° F. No definite scarlet fever rash was seen and nothing was found to explain the fever. Patient was sent to the ward for observation. The child appeared to be moderately ill and was maintained on supportive therapy.

The temperature spiked daily to 104°-102° F., but he looked comfortable.

On March 27, 1950, three days after admission, a blood count showed 6,000 white cells and 54 per cent polys. Fine râles were heard in the chest, and the pharynx was injected. Slight tremors of the extremities were noted and the child seemed unable to keep

his balance when standing. On March 28, 1950, he had a generalized convulsion. An injection of ¼ grain of sodium phenobarbital was given without apparent response. He had had several convulsions in a period of 15 minutes. At 6:17 A.M. respirations ceased. There was no response to artificial respiration and intracardiac epinephrine.

Microscopic Slides were projected. The primary tuberculous pneumonic focus was caseous, with visible outlines of the alveoli. The process was seen to involve the walls of several bronchi adjacent to the area of caseation. A large mediastinal lymph node was almost completely transformed into caseous necrotic matter. Miliary tubercles in various organs were shown. In the meninges, besides the larger tubercles which were seen grossly, several true miliary tubercles were found over the left motor area which showed no grossly visible tubercles. A larger tubercle, barely visible with the naked eye, was found in the white matter of the left temporal lobe. It appeared to be of approximately the same age as the larger tubercles of the meninges.

Therapy of Meningitis in Infants. (Archiv für Kinderheilkunde, Stuttgart, 138: 43, 1949). Grundler reports 2 cases of meningitis caused by Escherichia coli, in 1 infant aged 8 weeks and in 1 aged 10 weeks. The younger infant was given 12,000 units of penicillin every three hours by the intramuscular route (total 1,500,000 units) followed by 100,000 units by the intrathecal route. Penicillin therapy was combined with oral administration of sulfathiazole and a mixture of equal parts of sulfamerazine and the 4-aminomethylbenzene sulfonamide salt of sulfathiourea. The older infant was given 2 courses of penicillin with a total of 2,400,000 units by the intramuscular route and 140,000 units by the intrathecal route. Penicillin was combined with oral administration of sulfonamide compounds. Streptomycin was administered in doses of 0.1 Gm. two times daily by the intrathecal route during the interval between the two courses of penicillin. Both infants made a complete recovery. The result is noteworthy because in vitro penicillin seems to have no effect or to affect only certain strains of Esch. coli. There is also the possibility that the salutary results were due to the sulfonamide compounds and to the intrathecal therapy.—*Journal A.M.A.*

ITEMS

HURLER'S DISEASE. (Revista Cubana de Pediatria, Havana, 21: 633, Nov. 1949). According to Hurtado and collaborators, Hurler's disease (lipochondrodystrophy) is a rare congenital and familial disease characterized by dwarfism, skeletal deformities, a large head, with grotesque dwarflike face, clouding of the cornea, kyphosis, stiffness of the joints, flexed hands, hepatomegaly, splenomegaly and, in most cases, mental deficiency. The disease seems to be due to a disorder of the germinal plasma transmitted in accordance to mendelian law. The clinical diagnosis is easy and is confirmed by the skeletal abnormalities and wide involvement of bones as shown by roentgen examination. The prognosis is unfavorable. The patients are fragile. They frequently suffer from respiratory infections. The majority of the patients have cardiac disease which terminates fatally. The authors report 2 cases in a sister and a brother, 8 and 5 years old. The parents were first cousins. They were normal. There was no syphilis, tuberculosis or alcoholism in the parents or their families. Both patients had normal mentality for their age. The girl died of sudden cardiac failure.—*Journal A.M.A.*

EARLY CLINICAL DIAGNOSIS OF RICKETS. (Berliner medizinische Zeitschrift, 1: 46, Nov. 15, 1949). According to Hess most textbooks maintain that rickets usually makes its first appearance between the third and fourth months of life, at which time the diagnosis is based on the presence of craniotabes and the rachitic rosary. Thickening of the epiphyses is sometimes mentioned incidentally. The author shows that by palpating for the double malleolus (doubling of the epiphysis of the internal malleolus at the lower end of the tibia) one can ascertain the presence of rickets early, even during the first month of life. This was mentioned as a sign of rickets by Marfan, and its rachitic character has been demonstrated in pathologic studies carried out by Giese. Since the rachitic disturbances underlying this doubling of the epiphysis must exist before this sign becomes evident, the author suggests that prophylaxis for rickets should begin during the prenatal period.—*Journal A.M.A.*

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